VOLUME 46 JUNE 1953 NUMBER 6

Southern Medical Journal

Journal of the Southern Medical Association

Copyright, Southern Medical Association, 1953. Published monthly by the Southern Medical Association, Empire Building, Birmingham 3, Alabama. Annual subscription $10.00. Entered as Second-Class Matter at the Post Office at Birmingham, Alabama, under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized December 20, 1921.

Southern Medical Association, Forty-Seventh Annual Meeting, Atlanta, Georgia, October 26-29, 1953

TABLE OF CONTENTS

Fibrous Lesions of Bone. John P. Adams and J. Leonard Goldner, Durham, North Carolina 529

Discussed by Paul Thompson, Chattanooga, Tennessee; Lent C. Johnson, Washington, District of Columbia.

The Result of Primary Block Resection in Bone Tumors. Alberto Inclan and Pedro Leon, Havana, Cuba 537

Amputations of the Upper Extremity with Present Concepts of Prosthetic Replacement. Joseph W. Batch and August W. Spittler, Washington, District of Columbia 545

Discussed by Arthur H. Weiland, Coral Gables, Florida; T. Campbell Thompson, New York, New York; Milton S. Thompson, San Antonio, Texas; Alfred R. Shands, Jr., Wilmington, Delaware.

The Concept and Clinical Aspects of Factitial Dermatitis. D. Truett Gandy, Houston, Texas 551

The Advantages of X-Ray Diagnosis in Pregnancy. Robert H. Barter and John Parks, Washington, District of Columbia 555

Discussed by Walter L. Thomas, Durham, North Carolina; Ralph E. Campbell, Madison, Wisconsin; Louis H. Douglass, Baltimore, Maryland.

A Report on the Cytology of Fifty-Eight Hundred Vaginal Smears. Lee F. Turlington, W. Clare Barclift and Hunter M. Brown, Birmingham, Alabama ... 562

Discussed by J. Ernest Ayre, Miami, Florida.

Management of Polycystic Disease on an Ambulatory Basis. John H. Dougherty, Knoxville, Tennessee 566

Discussed by Haynes Baird, Charlotte, North Carolina; S. Joseph Pearlman, Miami Beach, Florida; Anthony A. Borski, Washington, District of Columbia.

Continuous Enteral Feeding and Its Importance in Protein Metabolism of the Sick. John Elliott, James J. Griffitts, Donald W. Smith, Geo. T. Lewis and Patrick V. Ferro, Miami, Florida 572

Discussed by Morton D. Pareira, St. Louis, Missouri.

The Use of Opiates in Chronic Illness. Rex Blankinship and Thomas F. Coates, Jr., Richmond, Virginia 578

Discussed by Sullivan G. Bedell, Jacksonville, Florida.

The Differentiation and Management of Abnormal Mental States in the Aged. Warren T. Brown and Jackson A. Smith, Houston, Texas 582

Physical Medicine and Rehabilitation as Applied to Geriatrics. A. B. C. Knudson, Washington, District of Columbia 585

Discussed by Ben L. Boynton, Houston, Texas.

The Changing Problems in Public Health. Wilson T. Sowder, Jacksonville, Florida 589

Discussed by Ben F. Wyman, Columbia, South Carolina; Joseph E. Schenthal, New Orleans, Louisiana; R. H. Riley, Baltimore, Maryland.

TABLE OF CONTENTS

Continued

Industrial Medicine and Private Practice. P. A. Davis, Akron, Ohio 594

The Treatment of Tendon Injuries. S. Benjamin Fowler, Don L. Eyler and George K. Carpenter, Nashville, Tennessee 601

Discussed by E. W. Cullipher, Miami, Florida.

Polyradiculopathy in Man Produced by St. Louis Encephalitis Virus (SLE). Murray Sanders, Alfred Blumberg, Coral Gables, Florida, and Webb Haymaker, Washington, District of Columbia 606

Discussed by Albert E. Casey, Birmingham, Alabama.

Recurrent Henoch-Schonlein Purpura. Arthur M. Freeman, Birmingham, Alabama 609

Discussed by C. Raymond Arp, Atlanta, Georgia; John S. Atwater, Atlanta, Georgia.

Cortisone in Ophthalmology: Clinical Evaluation of the Therapeutic Results. Louis A. Breffeilh, Shreveport, Louisiana 612

Pre- and Postoperative Care in Air Force Hospitals. Fred C. Dye, Geneva, New York 615

Acute Gangrenous Hernial Appendicitis with Perforation: Case Report. John S. Jackson, Lansing G. Childs and H. Max Schiebel, Durham, North Carolina 617

Electro-Encephalography in Allergic Epilepsy. Susan C. Dees, Durham, North Carolina 618

What the General Practitioner Should Know About the Management of Allergic Skin Disorders. Wiley M. Sams, Miami, Florida 620

EDITORIALS 625

Sodium Metabolism and Eclampsia
Cardiac Arrest
Twenty-Five Years Ago

BOOK REVIEWS 627

BOOKS RECEIVED 631

SOUTHERN MEDICAL NEWS 632

TULANE UNIVERSITY

SCHOOL OF MEDICINE

DIVISION OF GRADUATE MEDICINE

Basic Science course in Ophthalmology
Twelve months, beginning ..... July 1st

Basic Science as applied to Orthopedics
Five months, beginning ..... September 1st

Tropical Medicine and Public Health, leading to the degree of Master of Public Health and Master of Public Health (Tropical Medicine), Nine months, beginning ..... September 21st

Individually arranged long term courses

For detailed information write

DIRECTOR

1430 Tulane Avenue New Orleans 12, La.

TWO NEW EDITIONS

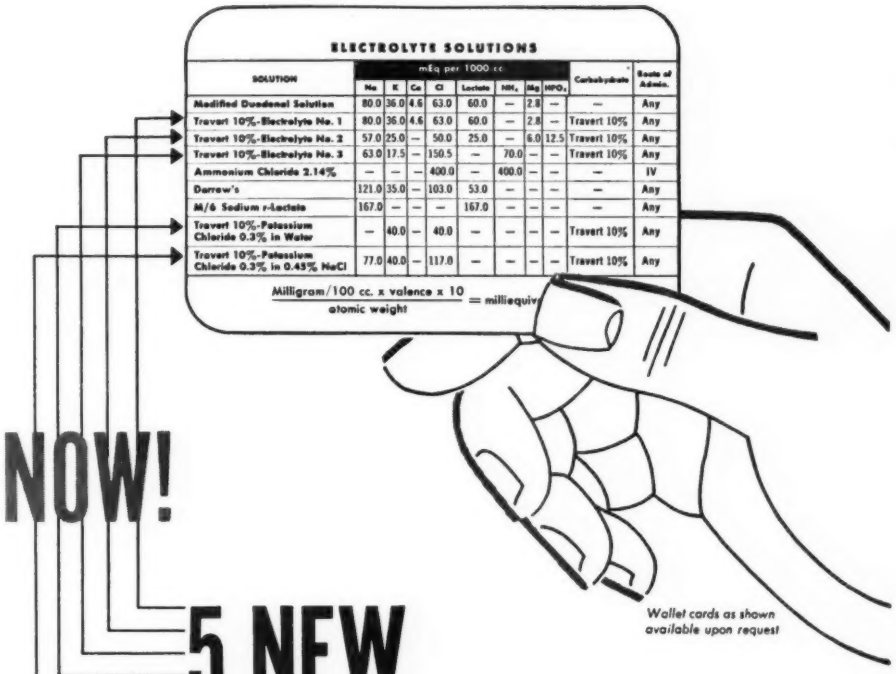
TeLinde — OPERATIVE GYNECOLOGY, by Richard W. TeLinde, M.D. Revised, rewritten and completely reset edition of an authoritative guide to recent advances in the field of gynecology. Five new chapters. Approximately 800 Pages and 300 Illustrations. Second Edition. $20.00

Pitkin — CONDUCTION ANESTHESIA, by George P. Pitkin, M.D. Edited by James L. Snavelsworth, M.D., Robert A. Hingson, M.D., Winifred M. Pitkin, M.D. An authoritative work on local anesthesia. Extensively revised to provide complete coverage of newest developments. Approximately 1,000 Pages and 600 Illustrations. Second Edition in Active Preparation. $22.50

SEND ORDERS TO

J. A. MAJORS COMPANY

New Orleans 12 Dallas 1 Atlanta 3


ELECTROLYTE SOLUTIONS
SOLUTION
mEq per 1000 cc
Na
K
Ca
Cl
Lactate
NH4
Mg
HPO4
Carbohydrate
Route of Admin.
Modified Duodenal Solution 80.0 36.0 4.6 63.0 60.0 — 2.8 — — Any
Travert 10%-Electrolyte No. 1 80.0 36.0 4.6 63.0 60.0 — 2.8 — Travert 10% Any
Travert 10%-Electrolyte No. 2 57.0 25.0 — 50.0 25.0 — 6.0 12.5 Travert 10% Any
Travert 10%-Electrolyte No. 3 63.0 17.5 — 150.5 — 70.0 — — Travert 10% Any
Ammonium Chloride 2.14% — — — 400.0 — 400.0 — — — IV
Darrow's 121.0 35.0 — 103.0 53.0 — — — — Any
M/6 Sodium r-Lactate 167.0 — — — 167.0 — — — — Any
Travert 10%-Potassium Chloride 0.3% in Water — 40.0 — 40.0 — — — — Travert 10% Any
Travert 10%-Potassium Chloride 0.3% in 0.45% NaCl 77.0 40.0 — 117.0 — — — — Travert 10% Any
Milligram/100 cc. x valence x 10 / atomic weight = milliequiv
NOW!
5 NEW
Wallet cards as shown available upon request

Travert® *10%-Electrolyte* solutions

OFFER ALL THE ADVANTAGES OF TRAVERT*

plus

REPLACEMENT OF ELECTROLYTES, AND CORRECTION OF ACIDOSIS AND ALKALOSIS

* twice as many calories as 5% dextrose, in equal infusion time, with no increase in fluid volume ★ a greater protein-sparing action as compared to dextrose ★ maintenance of hepatic function

Travert is a trademark of Baxter Laboratories, Inc.

products of

BAXTER LABORATORIES, INC.

Morton Grove, Illinois • Cleveland, Mississippi

DISTRIBUTED AND AVAILABLE ONLY IN THE 37 STATES EAST OF THE ROCKIES (except in the city of El Paso, Texas) THROUGH

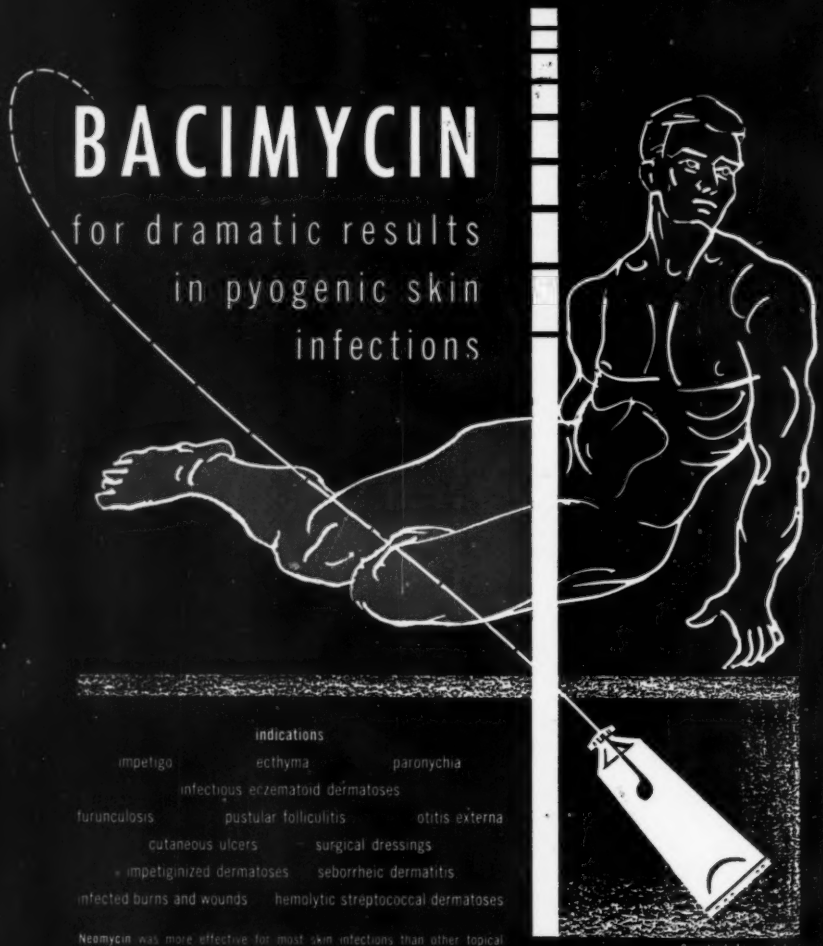
AMERICAN HOSPITAL SUPPLY CORPORATION

GENERAL OFFICES • EVANSTON, ILLINOIS

BACITRACIN NEOMYCIN OINTMENT

BACIMYCIN

for dramatic results in pyogenic skin infections



indications

impetigo ecthyma paronychia
infectious eczematoid dermatoses
furunculosis pustular folliculitis otitis externa
cutaneous ulcers surgical dressings
impetiginized dermatoses seborrheic dermatitis
infected burns and wounds hemolytic streptococcal dermatoses

Neomycin was more effective for most skin infections than other topical agents used in a series of 675 cases.[1]

Bacitracin has been widely favored for local treatment of skin infections.[2]

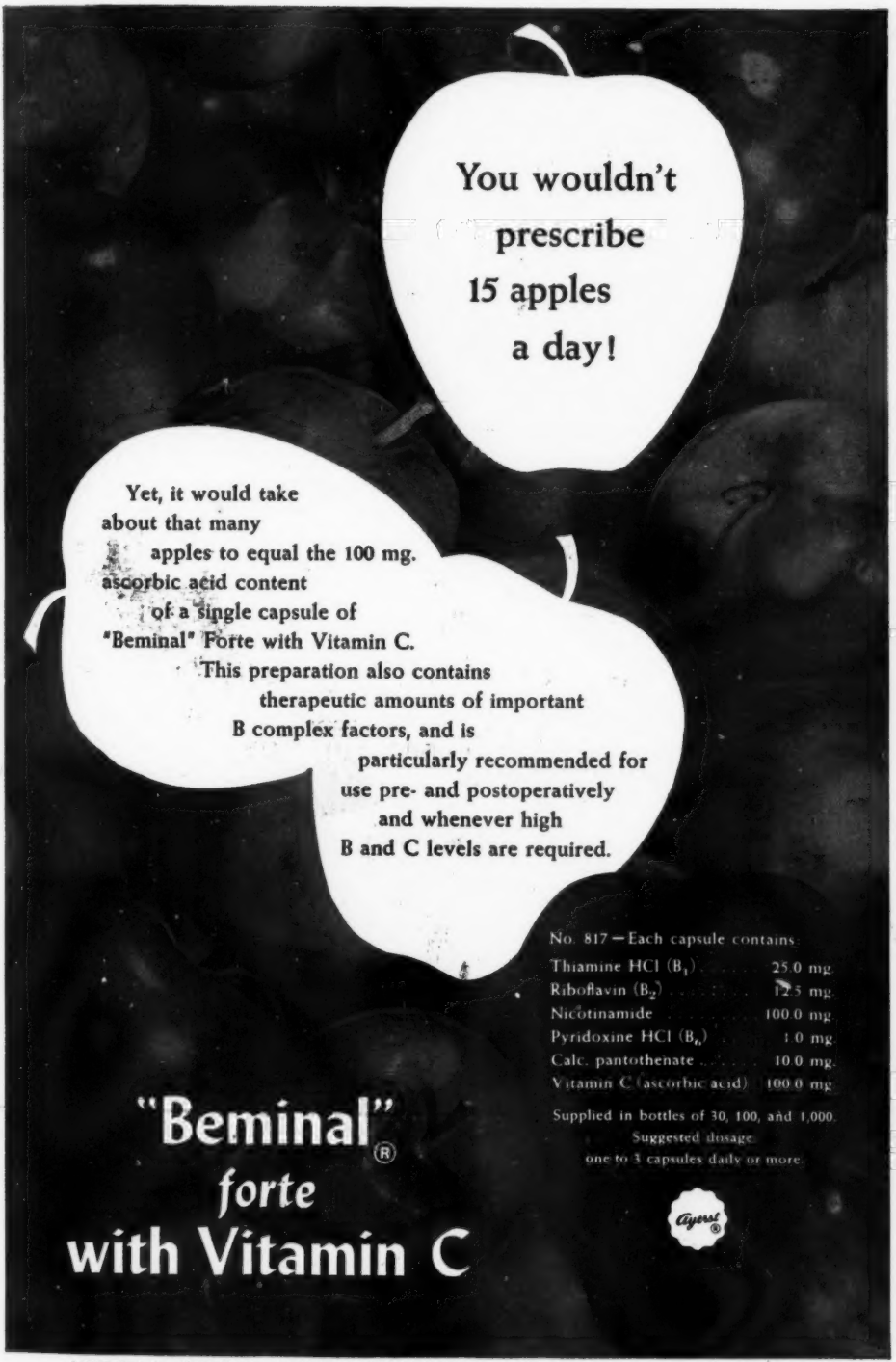
The **combination** of both antibiotics extends the broad-spectrum activity of each.[3]

Literature available including antibiotic comparison chart

1. Hall, W. L., and Rockwell, E. M.: J.A.M.A. 144:339, 1952. 2. Livingood, C. S., et al.: J.A.M.A. 148:334, 1952. 3. Wright, P. S.: G.P. 5:67, 1952.

Supplied: ½ oz. tubes

Walker
LABORATORIES, INC.
MT. VERNON, N. Y.


You wouldn't prescribe 15 apples a day!
Yet, it would take about that many apples to equal the 100 mg. ascorbic acid content of a single capsule of "Beminal" Forte with Vitamin C.
This preparation also contains therapeutic amounts of important B complex factors, and is particularly recommended for use pre- and postoperatively and whenever high B and C levels are required.
No. 817—Each capsule contains:
Thiamine HCl (B1) 25.0 mg.
Riboflavin (B2) 12.5 mg.
Nicotinamide 100.0 mg.
Pyridoxine HCl (B6) 1.0 mg.
Calc. pantothenate 10.0 mg.
Vitamin C (ascorbic acid) 100.0 mg.
Supplied in bottles of 30, 100, and 1,000.
Suggested dosage:
one to 3 capsules daily or more.
"Beminal"®
forte
with Vitamin C
Ayerst®

AYERST, McKENNA & HARRISON LIMITED • New York, N. Y. • Montreal, Canada

PROVED SUPERIOR*

in Every Age Group

The 100 patients in a carefully controlled evaluation of Vagisol in trichomoniasis ranged from 10 years to 80 years in age. Culture-established cure was shown in 98 of these patients, including every age group.

*Shaw, H. N.; Henriksen, E.; Kessel, J. F., and Thompson, C. F.: Clinical and Laboratory Evaluation of "Vagisol" in the Treatment of Trichomonas Vaginalis Vaginitis, Western J. of Surg., Obst. & Gynec. *60*:563 (Nov.) 1952.

In Trichomonas Vaginitis

Two important advantages of Vagisol Suppositabs in the treatment of Trichomonas vaginalis vaginitis were established in the study cited:

Remarkably rapid relief from the distressing symptoms which usually accompany trichomoniasis, such as pruritus, burning, suprapubic pain, dyspareunia, dysuria, etc. The patients became symptom-free after 2.15 mean patient days. The control patients, being treated with another widely prescribed antitrichomonad medication, required 6.75 days.

A 98% cure rate, in ½ to ¼ the time required by the control group. Vagisol produced culture-demonstrable cures for 72% of the patients in 18 days, for 22% in 36 days, and for 4% in 54 days. In the control group, 25% required 56 days of therapy, 42.5% 84 days, and 20% required 112 days.

Collaterally, several interesting points were brought out in this study. Vagisol is equally effective in every age group—in childhood, during the reproductive years, postmenopausally.

Though quickly relieved from painful and annoying symptoms, patients cooperate and remain on Vagisol therapy when properly instructed.

Vagisol Suppositabs, supplied in bottles of 36, are odorless and nonstaining. Each Suppositab contains:

Phenylmercuric Acetate	3.0 mg.
Tyrothricin	0.5 mg.
Succinic Acid	12.5 mg.
Papain	25.0 mg.
Sodium Lauryl Sulfate	3.0 mg.
Lactose	0.75 Gm.

Vagisol is available on prescription through any pharmacy. For detailed literature, for clinical test samples, and for instruction leaflets for distribution to patients, physicians are invited to write to Smith-Dorsey, Lincoln, Nebraska (a Division of The Wander Company).

VAGISOL

A DORSEY PREPARATION

from the research laboratories of the world's largest producer of antibiotics . . .

a new antibiotic
of special value

Magnamycin®

brand of carbomycin

Clinically active particularly against those infections caused by penicillin-resistant gram-positive pathogens—staphylococci, streptococci, and other enteric organisms.

Cross-resistance with penicillin, streptomycin and the broad-spectrum antibiotics has not been observed.

Well tolerated.

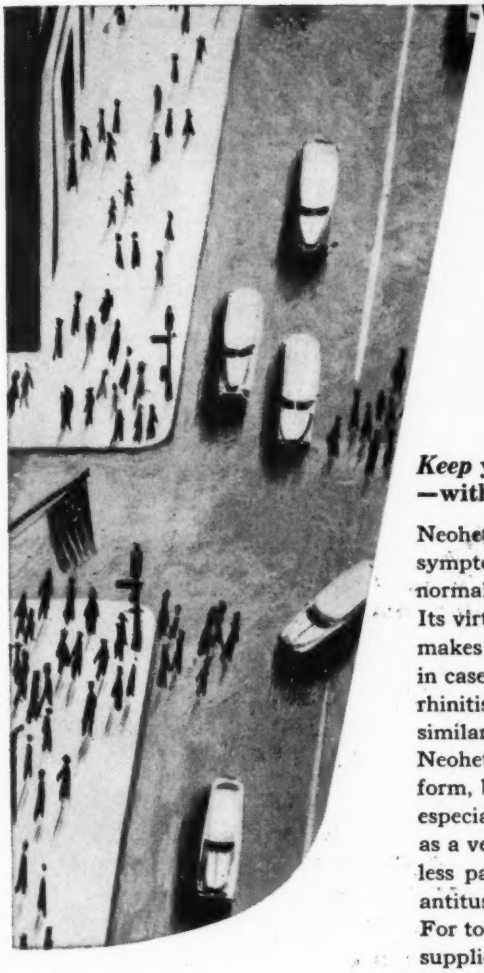
Magnamycin is not inactivated by the gastric secretions.

Available in the most familiar, readily accepted dosage form—sugar coated tablets.

Recommended dosage—1.0 to 2.0 Gm. daily in divided doses.

Supplied:
100 mg. tablets, bottles of 25 and 100

Antibiotic Division Pfizer CHAS. PFIZER & CO., INC.
Brooklyn 6, N. Y.



allergy
is essentially an ambulatory disease

***Keep* your allergic patients ambulatory —with Neohetramine.**

Neohetramine effectively relieves allergic symptoms without significant impairment of normal daytime alertness.

Its virtual freedom from toxicity and sedation makes Neohetramine an antihistamine of choice in cases of hay fever, allergies, nonseasonal rhinitis, urticaria, angioneurotic edema and similar conditions.

Neohetramine is available not only in tablet form, but also as a highly palatable syrup . . . especially pleasing to children . . . most suitable as a vehicle for the administration of other less palatable medications (expectorants, antitussives, and the like).

For topical application, Neohetramine is supplied as a soothing cream.

Tablets.....25, 50, and 100 mg. in bottles of 100 and 1,000.
Syrup .....6.25 mg. per cc. in bottles of 1 pint.
Cream 2%.....in water-miscible base, collapsible tubes of 1 oz.

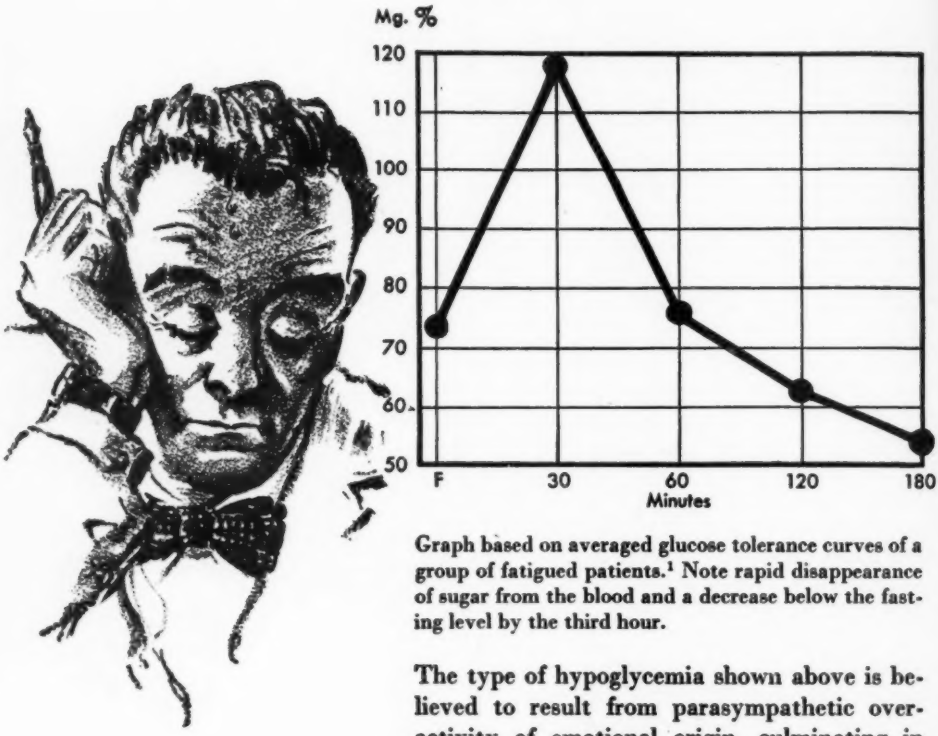
Neohetramine® HYDROCHLORIDE

Brand of Thonzylamine Hydrochloride

potency without penalty

in antihistamine therapy

NEPERA CHEMICAL CO., INC.
Pharmaceutical Manufacturers
Nepera Park, Yonkers 2, N. Y.



Graph based on averaged glucose tolerance curves of a group of fatigued patients.[1] Note rapid disappearance of sugar from the blood and a decrease below the fasting level by the third hour.

The type of hypoglycemia shown above is believed to result from parasympathetic overactivity of emotional origin, culminating in hyperinsulinism.

Daily administration of atropine or belladonna with phenobarbital, to block excessive parasympathetic impulses, is recommended as a valuable adjunct to dietary measures in stabilizing the carbohydrate metabolism in these and similar cases of emotogenic hypoglycemia.[1-3]

IN FATIGUE STATES DUE TO EMOTOGENIC HYPOGLYCEMIA

1. Portis, S. A., et al.: J.A.M.A. 144:1162, 1950. 2. Fabrykant, M., and Pacella, B. L.: Arch. Int. Med. 81:184, 1948. 3. Cronk, G. A.: Journal-Lancet 71:484, 1951.

BELBARB

BELLADONNA ALKALOIDS AND PHENOBARBITAL

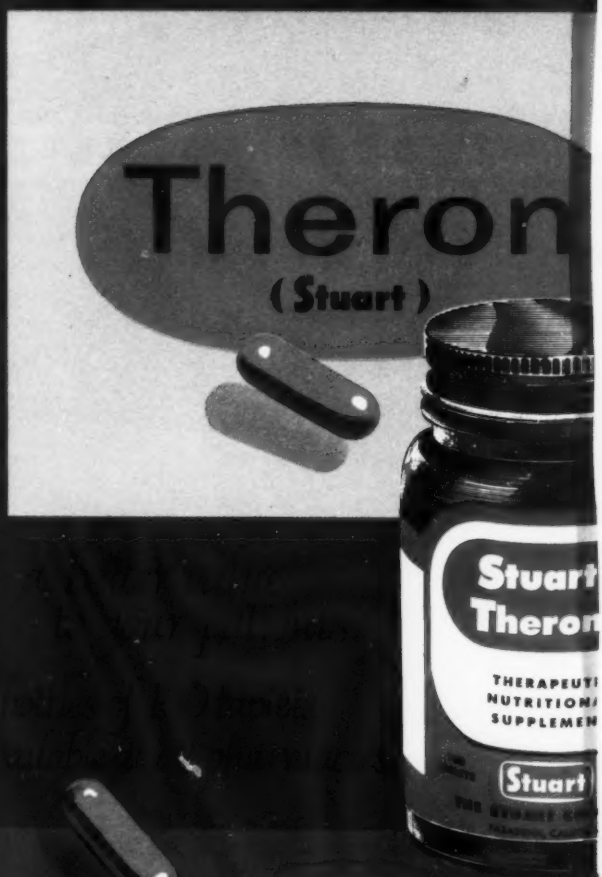
SUPPLIED: BELBARB* and BELBARB NO. 2 (tablets) and BELBARB Capsules, bottles of 100, 500, and 1000; BELBARB Elixir, bottles of 1 pt. and 1 gal.

LITERATURE AND SAMPLES ON REQUEST

CCH

CHARLES C. HASKELL & CO., INC.
RICHMOND VIRGINIA

*Trademark of Charles C. Haskell & Co., Inc.



One tablet contains:

Potencies recently suggested by National Research Council for stress conditions:

Thiamin Chloride.	10 mg.
Riboflavin.....	10 mg.
Niacin Amide.....	100 mg.
Calcium Pantothenate...	20 mg.
Pyridoxin Hydrochloride..	2 mg.
Ascorbic Acid....	300 mg.
Vitamin B_{12}	4 mcg.

Important when antibiotics or sulfonamides are used:

Vitamin K.....	2 mg.

Therapeutic amount of synthetic Vitamin A:

Vitamin A	25,000 USP units
Vitamin D	1,000 USP units

Unidentified Natural B Factors:

Yeast and liver fraction 2

Important Minerals:

Calcium.....	100 mg.
Phosphorus.....	20 mg.
Iron.....	15 mg.
Copper.....	1 mg.
Iodine.....	0.15 mg.

Trace Minerals:

Manganese.....	1 mg.
Magnesium.....	6 mg.
Potassium.....	5 mg.
Zinc.....	1.5 mg.
Cobalt.....	0.1 mg.

NEW SPECIALLY CONSTRUCTED TABLET
RELEASES HYDROCHLORIC ACID
GRADUALLY INTO STOMACH AT A RATE
MORE CLOSELY PARALLELING NORMAL

BETTER TOLERATED – MORE EFFECTIVE

NORMACID TABLETS
(Stuart)

ADVANTAGES:

1. Specially constructed tablet releases hydrochloric acid in the stomach at a more normal rate. Eliminates disadvantages of the sudden release of HCl.
2. Permits larger dosage in one tablet; each tablet provides equivalent of 15 minims dilute HCl acid.
3. Better tolerated—more effective.

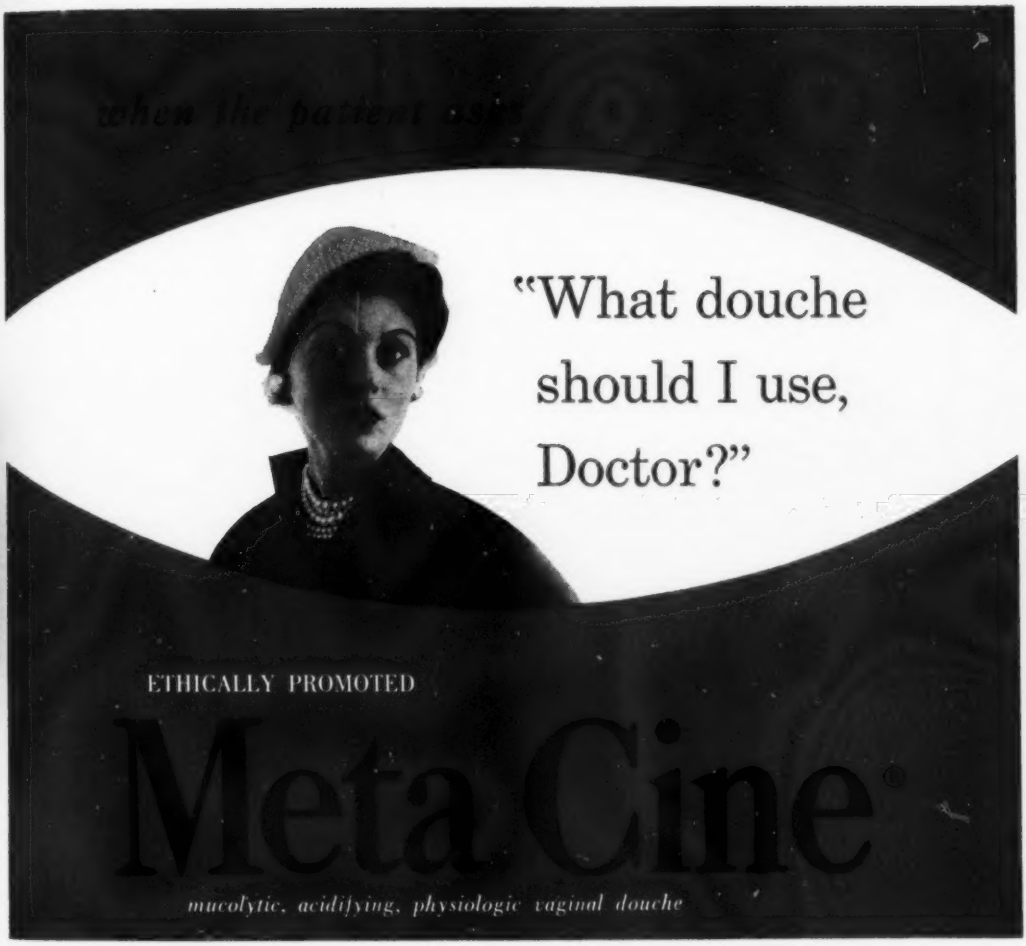
EACH TABLET CONTAINS:

440 mg. Betaine Hydrochloride
32.4 mg. Pepsin
110 mg. Methylcellulose (controls release of HCl)

Stuart

BOTTLES OF 100...available at all pharmacies

THE STUART COMPANY • PASADENA 1, CALIFORNIA



In answer to questions about douching you can recommend META CINE with complete confidence BECAUSE META CINE:

1. is a safe, soothing douche (pH 3.5) containing methyl salicylate, eucalyptol, menthol, chlorothymol and PAPAIN to liquefy mucus. CITRIC ACID to help restore the proper acid pH, discourage pathogenic organism, promote normal vaginal flora. LACTOSE to feed the physiologic Doderlein bacilli.

2. is pleasant and refreshing to the patient . . . and deodorizing.

3. has a surface tension of 56 dynes/cm as compared to 72 dynes/cm for the usual vinegar douche.

4. is economical . . . only two teaspoonfuls to two quarts of water . . . supplied in eight-ounce containers.

5. is useful as a routine, cleansing douche, as an adjuvant when treating leukorrheal infections, and following cervical cauterizations and conizations.

UPON YOUR REQUEST *a free supply of instruction sheets will be sent for your convenience in advising patients on the correct douching technique.*

BRAYTEN PHARMACEUTICAL COMPANY, 3810 St. Elmo Avenue, Chattanooga 9, Tennessee

Ciba SUMMIT, N. J.

In the "diaper age"
safer, simpler treatment
for urinary infections

ELKOSIN® SYRUP
SULFADIMETINE CIBA

- effective against a wide range of gram-negative and gram-positive organisms
- high solubility even in acid urine
- no alkalis needed
- finer particle size . . . for better suspension . . . uniform dosage
- mixes readily with milk, fruit juices

ELKOSIN SYRUP — a microcrystalline suspension of sulfadimetine in a strawberry-flavored syrup — 0.25 Gm. per teaspoonful (4 cc.). Pints. Also 0.5 Gm. double-scored tablets. Bottles of 100 and 1000.

ELKOSIN *a new advance in sulfonamide safety*

2/1093M

Diarrhea controlled by Cremosuxidine - even those of complex etiology

Pleasant-tasting CREMOSUXIDINE *is willingly taken by children as well as adults.*

Cremosuxidine

SHARP & DOHME

SULFASUXIDINE® SUSPENSION WITH PECTIN AND KAOLIN

Since the etiology of diarrhea is frequently complex, no single agent may be expected to effect prompt or complete relief. CREMOSUXIDINE contains three antidiarrhetic agents, each of which acts specifically against the several causes of diarrhea.

1. SULFASUXIDINE®

SULFASUXIDINE is one of the drugs most widely employed to control infections of the intestinal tract. Since less than 5% is absorbed, this drug remains in exceptionally effective concentration for maximum intestinal bacteriostasis. CREMOSUXIDINE contains 1.5 Gm. sulfasuxidine per tablespoonful.

2. PECTIN

As incorporated in CREMOSUXIDINE, pectin (1%) specifically helps neutralize the diarrhetic effects of many toxins and irritants, aids formation of normal stools.

3. KAOLIN

Specifically, the kaolin in CREMOSUXIDINE (1.5 Gm. per tablespoonful) acts as an adsorbent, to remove irritants, and toxic bacterial by-products.

IN COMPLEX ETIOLOGY . . .

Because of the completeness of its formula, CREMOSUXIDINE may be relied upon to provide symptomatic relief in most types of diarrhea, regardless of etiology.

SUPPLIED

CREMOSUXIDINE, a smooth, homogeneous, pleasantly flavored suspension, is supplied in SPASAVER® bottles of 16 fluidounces.

Sharp & Dohme, Philadelphia 1, Pa.

Anytime . . .

Anywhere . . .

Gratifying Relief from Pain, Urgency, and Frequency

Whenever distressing symptoms of urogenital infection occur— Wherever the patient may be . . .

PYRIDIUM acts fast. Within a matter of minutes, it affords safe, local analgesia to soothe the irritated urogenital mucosa in cystitis, prostatitis, urethritis, and pyelonephritis. PYRIDIUM is compatible with antibiotics, the sulfonamides, or other specific therapy.

PYRIDIUM®

(Brand of Phenylazo-diamino-pyridine HCl)

PYRIDIUM is the registered trade-mark of Nepera Chemical Co., Inc. for its brand of phenylazo-diamino-pyridine HCl. Merck & Co., Inc. sole distributor in the United States.

MERCK & CO., INC.

Manufacturing Chemists

RAHWAY, NEW JERSEY

new! completely aqueous...

Aquasol A-C-D drops

New studies[1,2] with "oil-in-water"* vitamin solutions, developed by the Research Laboratories of the U. S. Vitamin Corporation, confirm their superiority over ordinary vitamin solutions in oil.

A special processing technique removes the fats, fatty acids, oil and other extraneous non-vitamin materials, thus eliminating or minimizing the allergenic factors found in fish liver oil . . . no fish taste or odor.

vitamin A in aqueous solution *accomplishes*

quicker absorption
more complete absorption
better utilization
higher liver storage
less excretion

than ordinary vitamin A in oil

Each 0.6 cc. provides:

Vitamin A* (natural) . . 5000 U.S.P. Units
Vitamin D* (natural) 1000 U.S.P. Units
Ascorbic Acid (C) . . . . . 75 mg.
*oil-soluble vitamins made water-soluble with sorethytan esters; protected by U. S. Patent 2,417,299.

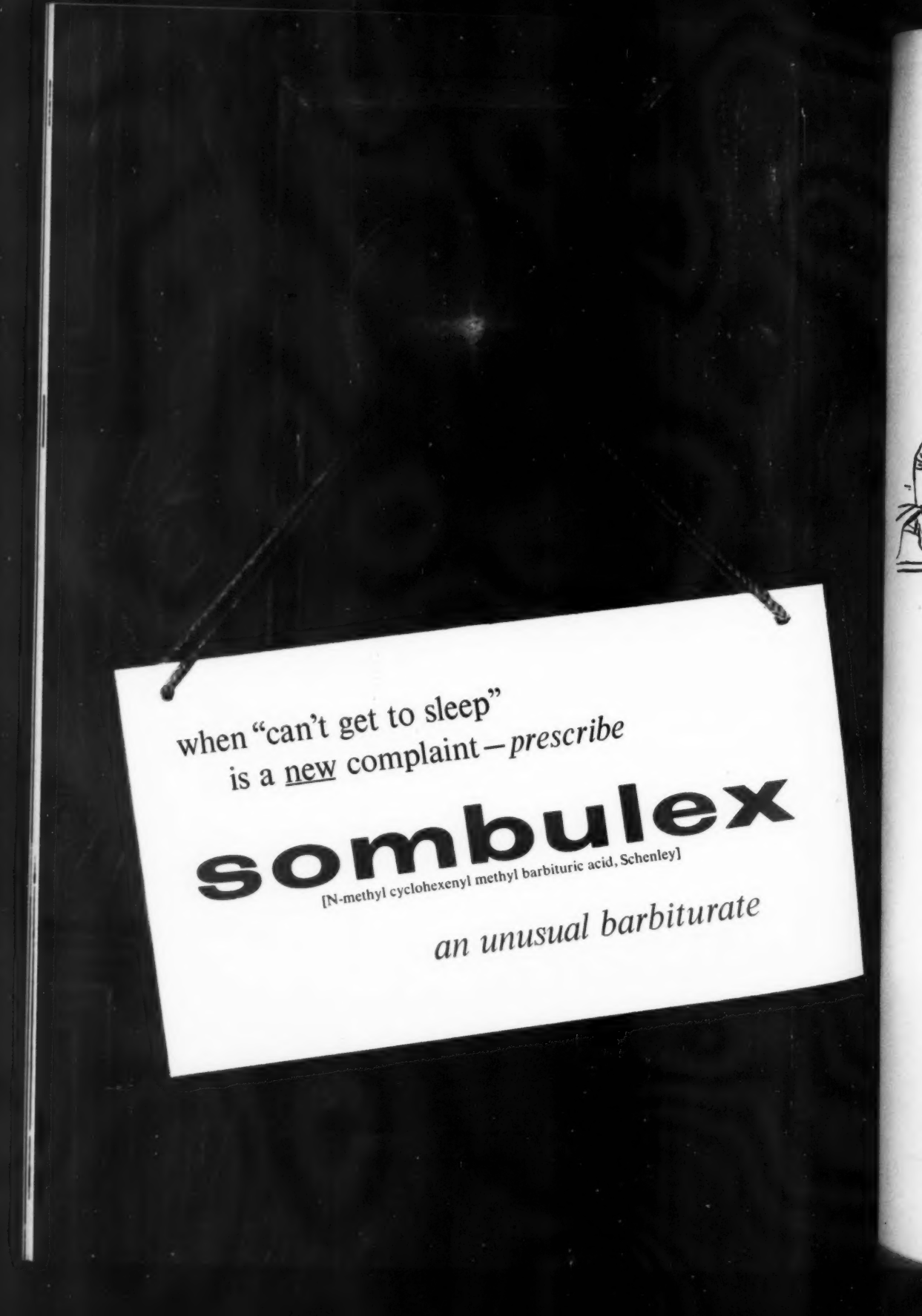
Packaged in bottles of 15 cc. and 30 cc.

1. Lewis, J. M. and Cohlan, S. Q.: M. Clin. N. A. March 1950.
2. Sobel, A. E. et al.: Am. J. Dis. Child. Dec. 1950.

Samples on Request

u. s. vitamin corporation
Casimir Funk Laboratories, Inc. (affiliate)
250 east 43rd st. • new york 17, n. y.

exceptionally palatable candy-like taste


when "can't get to sleep"
is a new complaint—prescribe
sombulex
[N-methyl cyclohexenyl methyl barbituric acid, Schenley]
an unusual barbiturate

sombulex* *is an unusual barbiturate*

because it works within 15 to 30 minutes and leaves the bloodstream within 3 to 4 hours, thus avoiding the danger of hangover for patients who do not need heavy barbiturate action.

When the stresses and strains begin to tell

...when the mind won't let the body rest, and patients complain for the first time..."Doctor, I can't get to sleep"... SOMBULEX is the prescription of choice for these first-time barbiturate patients. For them, 1 or 2 tablets taken with water or a warm beverage usually suffice to induce a night's refreshing sleep without hangover. Patients will not readily identify SOMBULEX as a barbiturate.

The unusual uses of **sombulex**

Because of its rapid yet nonpersistent action, 1 SOMBULEX Tablet will help restore *interrupted* sleep without subsequent hangover, or permit a relaxing cat nap before a busy evening. One SOMBULEX Tablet also will help the new night-shift worker adjust to a daytime sleeping schedule. NOTE: The action of SOMBULEX may be too short lived for the patient already dependent upon long-acting barbiturates. SOMBULEX is supplied in bottles of 100 tablets, each containing 0.26 Gm. (4 gr.) N-methyl cyclohexenyl methyl barbituric acid, *Schenley*.

SCHENLEY LABORATORIES, INC. schenley

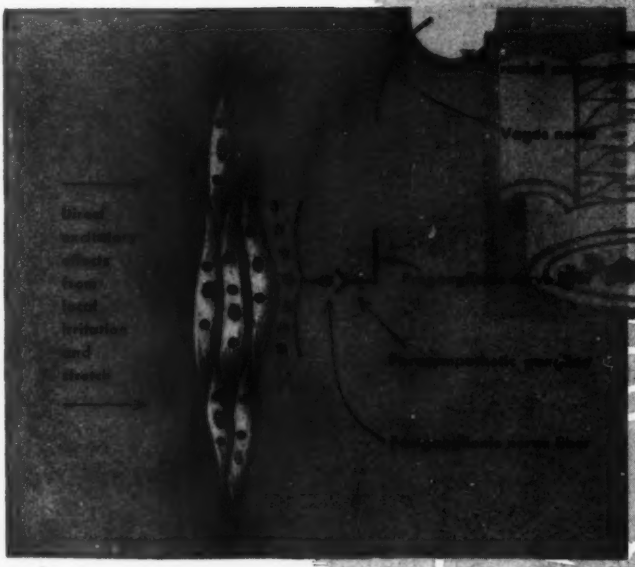
© Schenley Laboratories, Inc. *Trademark of Schenley Laboratories, Inc.

PARASYMPATHOLYTIC ACTION

means dependable relief of

GASTRO-INTESTINAL SPASM

Homatropine methylbromide is parasympatho*lytic* (therefore spasmo*lytic*) in *all* therapeutic dosages. Since many drugs are parasympatho*mimetic* in customary dosages and parasympatho*lytic* only in high dosages [illegible] disturbing side effects, homatropine methylbromide is preferred for dependable relief of gastro-intestinal spasm.



In Lusyn the spasmolytic efficacy of homatropine methylbromide is reinforced by phenobarbital to allay emotional tension. The alukalin present provides welcome antacid-adsorbent efficiency.

Indicated in intestinal spasm, biliary spasm, pylorospasm, cardiospasm, and irritable colon.

PARASYMPATHETIC BLOCKING AGENT

Homatropine methylbromide relieves gastro-intestinal spasm by preventing the action of acetylcholine on smooth muscle cells.

EACH TABLET CONTAINS:

Homatropine methylbromide ..... 5 mg.
(increased from 2.5 mg.)
Alukalin (activated kaolin) ..... 300 mg.
Phenobarbital ..... 15 mg.
(increased from 8 mg.)

SUPPLIED: Bottles of 100, 500, and 1000 tablets.

MALTBIE LABORATORIES, INC., NEWARK 1, N. J.

LUSYN®

When the Symptoms of Critically Elevated Blood Pressure

Must be Relieved Rapidly

SOLUTION INTRAMUSCULAR

VERILOID®

In

HYPERTENSIVE CRISES

Given in proper dilution slowly by vein, Solution Intravenous Veriloid usually reduces both the systolic and diastolic blood pressures in a matter of minutes—entirely within the control of the physician. This valuable emergency drug frequently proves to be a life-saving measure. Contains 0.4 mg. of alkavervir (mixed Veratrum viride alkaloids) in 0.25 per cent acetic acid solution.

The dependable hypotensive response produced by Solution Intramuscular Veriloid quickly relieves the distressing symptoms of critically elevated blood pressure. Injected deep into a muscle, a single dose of Solution Intramuscular Veriloid leads to a significant fall in blood pressure. Attaining its maximum effect in 60 to 90 minutes, this drop persists for 3 to 6 hours. Through repeated injections, the tension may be kept depressed for many hours or even days if necessary.

During this period, continuous relief is afforded the patient. Thereafter, suitable oral medication should be given in an effort to maintain the relief so achieved.

Solution Intramuscular Veriloid is widely indicated in all types of severe hypertension:

- hypertensive states accompanying cerebral vascular disease
- malignant hypertension
- hypertensive crisis (encephalopathy)
- toxemias of pregnancy
- pre-eclampsia
- eclampsia

Solution Intramuscular Veriloid, providing 1.0 mg. of alkavervir (mixed Veratrum viride alkaloids) per cc. of isotonic buffered aqueous solution incorporating one per cent procaine hydrochloride, is supplied in 2 cc. ampuls in boxes of 6.

RIKER LABORATORIES, INC.

8480 BEVERLY BOULEVARD • LOS ANGELES 48, CALIFORNIA

VERILOID, GENERICALLY DESIGNATED ALKAVERVIR, IS

An Original Riker Research Product

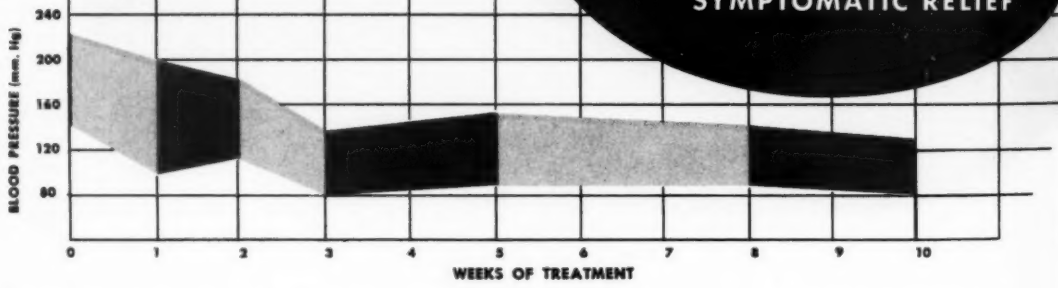
220/140 mm. Hg.

COMPLAINTS:
HEADACHES...
MARKED DYSPNEA...
TRANSIENT HEMIPLEGIA

BLOOD PRESSURE REDUCED WITH VERILOID TO

130/80 mm. Hg.

RESULT:
VIRTUALLY COMPLETE
SYMPTOMATIC RELIEF



This excellent response to orally administered Veriloid was obtained in a male patient, aged 41.* Treated as an outpatient for four months, his blood pressure dropped to normal limits under the influence of Veriloid. Concurrently, he experienced considerable symptomatic improvement and was able to resume his former physically strenuous work. Special studies on this patient showed that the blood pressure was well controlled throughout the day.

Not every patient shows this spectacular response to oral Veriloid. However, a sufficiently large number do, warranting the administration of this hypotensive agent to every patient with elevation of blood pressure sufficient to require treatment. For this reason, the suggestion has been made that all hypertensive patients should be screened to identify those who respond well to veratrum preparations.**

*Kauntze, R., and Trounce, J.: Treatment of Arterial Hypertension with Veriloid, Lancet 2:1002 (Dec. 1) 1951.
**Page, I. H.: Arterial Hypertension, Pennsylvania M. J. 55:737 (Aug.) 1952.

Veriloid is available in three dosage forms for oral administration:

Veriloid (plain) in 1, 2, and 3 mg. scored tablets; starting dosage 9 to 15 mg. daily, to be adjusted according to response and tolerance.

Veriloid with Phenobarbital (Veriloid-VP), each scored tablet presenting Veriloid 2 mg. and phenobarbital 15 mg.

Veriloid-VPM, each scored tablet containing Veriloid 2 mg., phenobarbital 15 mg., and mannitol hexanitrate 10 mg. Initial recommended dosage for VP and VPM, 1 to 1½ tablets t.i.d. or q.i.d.

RIKER LABORATORIES, INC. • 8480 BEVERLY BOULEVARD, LOS ANGELES 48, CALIFORNIA

For prompt control of infection of

TRAUMATIC LESIONS:

FURACIN

BRAND OF NITROFURAZONE N.N.R.

A stable bactericide without tissue toxicity:

FURACIN SOLUBLE DRESSING

1

2

Injury 15 years previously, of the right leg of a man 45 years old, had never healed.

There was extensive superficial ulceration and profuse purulent discharge with Ps. aeruginosa (pyocyaneus), P. vulgaris, diphtheroids, Str. pyogenes, M. pyogenes albus (Fig. 1).

December 4. Furacin Soluble Dressing was applied twice daily with gauze covering. Discharge soon decreased and granulations were filling in. Fibrous tissue was curetted and the lesion skin-grafted. Furacin therapy was continued. There was a favorable percentage of "take."

January 7. Patient discharged (Fig. 2).

Some advantages of Furacin:

- wide antibacterial spectrum
- designed for external use only
- negligible toxicity for human tissues

Formula: Furacin preparations contain Furacin® 0.2% in water-miscible vehicles which dissolve in exudates.

Literature on request

ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY

EATON LABORATORIES Inc.
NORWICH, NEW YORK

The NITROFURANS
A unique class of antimicrobials

FURACIN SOLUBLE DRESSING • FURACIN SOLUTION • FURACIN ANHYDROUS EAR SOLUTION

1. immediate 2. sustained 3. prolonged reduction in blood pressure

Capsules RAY-TROTE combine three supplementing therapeutic agents which serve to control high blood pressure with maximum efficiency. Capsules RAY-TROTE introduce a timing element essential for the safest and most satisfactory control of hypertension.

NITROGLYCERIN: Because of its rapid vasodilating action, nitroglycerin reduces blood pressure almost instantaneously. To give the patient immediate relief, it still remains the drug of choice.

SODIUM NITRITE: Sodium nitrite is a somewhat slower acting vasodilator, and begins to take full effect as the action of nitroglycerin subsides.

VERATRUM VIRIDE: Veratrum viride is probably the most active and reliable cardiac depressant. Although slow to act, its depressant effect on blood pressure is prolonged, exceeding that of sodium nitrite by several hours.

Consequently, capsules RAY-TROTE provide, in a single dosage form, immediate, sustained and prolonged therapeutic activity.

Note: *Raymer veratrum viride is both chemically and physiologically standardized (see kymograph tracings) to insure uniform action.*

PHENOBARBITAL: Capsules RAY-TROTE also contain phenobarbital, to maintain a calmer, more restful hypertensive patient.

DOSAGE: One capsule every three or four hours. Discontinue use if pulse becomes abnormally slow, or patient complains of nausea.

3-stage action
to control hypertension

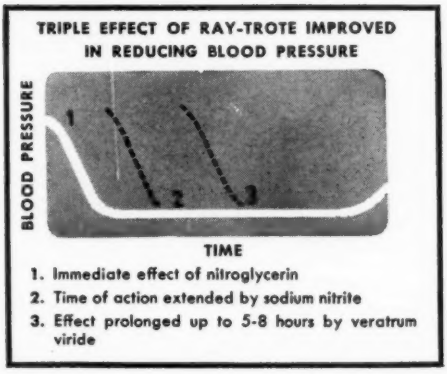
RAY-TROTE

Capsules Improved

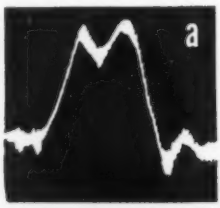
Formula: Each capsule contains:

Nitroglycerin	0.25 mg.
Sodium Nitrite	30 mg.
Veratrum viride (standardized to 1.0% alkaloid content)	65 mg.
Phenobarbital	15 mg.

Supplied in bottles of 100, 500 and 1,000 capsules. Also available, Capsules RAY-TROTE *with Rutin. In addition to the* RAY-TROTE *formula, each capsule contains* Rutin, *20 mg.*

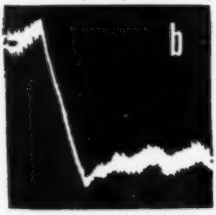


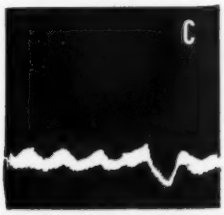
1. Immediate effect of nitroglycerin
2. Time of action extended by sodium nitrite
3. Effect prolonged up to 5-8 hours by veratrum viride



a. Pressor response to carotid sinus reflex (in dog) during control period.

b. Injection of Raymer standardized veratrum viride effects marked (57%), and almost instantaneous, fall in blood pressure.
c. Raymer standardized veratrum viride completely abolishes pressor response to carotid sinus reflex —providing a conclusive physiological measure of therapeutic hypotensive activity and uniform potency of the drug.

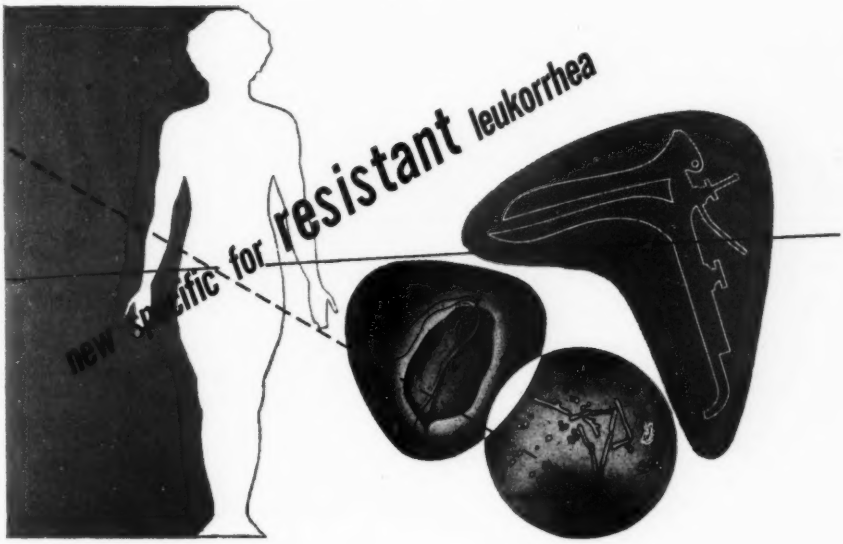




RAYMER

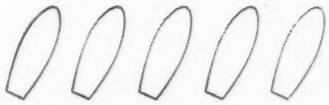
RAYMER PHARMACAL COMPANY
Pharmaceutical Manufacturers
Jasper and Willard Streets, Philadelphia 34, Pa.

Serving the Medical Profession for Nearly a Third of a Century



HIGHLY SUCCESSFUL — Extensive clinical investigations have yielded successful results with Milibis vaginal suppositories in 97 per cent of cases of trichomonal, monilial, bacterial and mixed vaginal infections.

RAPID RESPONSE — In most instances, 5 Milibis vaginal suppositories, one inserted every other night, proved sufficient.



MILIBIS® VAGINAL SUPPOSITORIES

Supplied in boxes of 5, each suppository containing 0.25 Gm. of Milibis in a gelatin-glycerine base.

Winthrop-Stearns INC.
NEW YORK 18, N. Y. WINDSOR, ONT

Milibis, trademark reg. U. S. & Canada, brand of bismuth glycolylarsanilate

An important new preparation... clinically accepted ...for lowering blood pressure in both benign and malignant hypertension

(1) Crumpton, C. W. et al.: Abstract, Society for Pharm. & Exper. Therap., September 8-10, 1952, J. Pharm. & Exper. Therap., 106:378, December, 1952. (2) Currens, J. H. et al.: Abstract, Program, American Heart Assn., April 18-19, 1952. (3) Meilman, E., and Krayer, O.: Circulation, 6:212, August, 1952. (4) Hoobler, S. W. et al.: Ann. Internal Med., 37:465, September, 1952. (5) Smirk, F. H., and Chapman, O. W.: Am. Heart J., 43:586, 1952. (6) Nash, H. A. and Brooker, R. M.: Abstracts of Papers, 122nd Meeting Am. Chem. Soc. (September, 1952) p. 231. (7) Nash, H. A., and Brooker, R. M.: J. Am. Chem. Soc. (in Press).

PROTOVERATRINE

. . . recently established as one of the most potent and the best tolerated of veratrum derivatives for symptomatic treatment of hypertension

IS NOW AVAILABLE

Clinical investigations[1-5] show that adequate doses of protoveratrine produce a significant decrease in systolic and diastolic blood pressures . . . frequently with alleviation of such symptoms as headache, insomnia, delirium, dizziness and blurred vision.

When dosage is carefully adjusted to patient tolerance, blood pressure can often be maintained near normal levels indefinitely.[2]

VERALBA*

[Brand of Protoveratrines A and B . . . chemically standardized by an original Pitman-Moore assay.[6, 7]]

The individual patient's effective dose can be readily established with Veralba Tablets. Their *chemically-standardized* protoveratrine content is more constant in potency than biologically-assayed preparations . . . permitting the accurate dosage essential for optimal results from protoveratrine therapy.

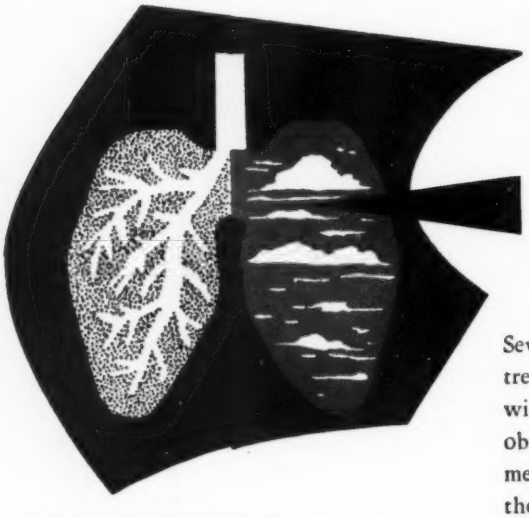
Veralba is supplied as 0.2 mg. and 0.5 mg. grooved tablets, in bottles of 100.

A "dose-establishment" package of 36 (0.2 mg.) tablets and abstracts of clinical investigations are available on request.

*Trademark

PITMAN-MOORE COMPANY
Pharmaceutical and biological chemists
INDIANAPOLIS 6, INDIANA
Division of Allied Laboratories, Inc.

The most significant result in the treatment of *Bronchial Asthma*



HP*ACTHAR *Gel*
(IN GELATIN)

Advantages

Administered as Easily as Insulin:
Subcutaneously or intramuscularly with a minimum of discomfort.

Fewer Injections:
One or two doses per week in many instances.

Rapid Response, Prolonged Effect:
Combines the two-fold advantage of sustained action over prolonged periods of time with the quick response of lyophilized ACTHAR.

Much Lower Cost:
Recent significant reduction in price, and reduced frequency of injections, have advanced economy of ACTH treatment.

Severe bronchial asthma can now be treated in the home and in the office with a degree of success similar to that obtained with hospital care. Improvement is prompt and dramatic. Neither the patient's age nor the chronicity of the asthmatic condition detracts from the efficacy of ACTHAR treatment, which has stood the most severe of all tests of usefulness—the requirements of the general practitioner. The use of the disposable cartridge syringe—an immediately available form of HP* ACTHAR *Gel*—can be a life-saving measure in the medical emergency which suddenly arises in the course of long-standing "intractable" asthma. HP*ACTHAR *Gel* has demonstrated its superiority over customary measures in many instances of bronchial asthma, and has brought about gratifying remissions lasting as long as 18 months.

*Highly Purified. ACTHAR® is The Armour Laboratories Brand of Adrenocorticotropic Hormone—ACTH (Corticotropin).

THE ARMOUR LABORATORIES
A DIVISION OF ARMOUR AND COMPANY • CHICAGO 11, ILLINOIS

world-wide dependability

PHYSIOLOGIC THERAPEUTICS THROUGH BIORESEARCH

WHENEVER DIARRHEA

is Encountered

Arobon is widely applicable whenever diarrhea or loose stools must be overcome. Its action is prompt and dependable, regardless of the underlying cause of the diarrhea.

Prepared from specially processed carob flour, Arobon provides a high natural content of pectin, lignin and hemicellulose. Thus it exerts a combined adsorptive, demulcent, water-binding action which is promptly effective in all age groups—adults, children, infants. In most diarrheas, Arobon suffices as the sole medication; in the specific dysenteries and the severe infectious diarrheas, it serves as a valuable adjuvant to specific medication.

ESPECIALLY USEFUL IN WARM WEATHER DIARRHEA

The diarrheas so frequently encountered during warm weather respond especially well to Arobon with its demulcent and adsorptive action.

Arobon is easily and quickly prepared for use with milk or water. Although it contains no chocolate, when mixed with milk it makes a tasty mixture having a chocolate-like flavor.

Physicians are invited to write for clinical test samples of Arobon.

Arobon is available in 5 ounce jars through all pharmacies.

THE NESTLÉ COMPANY, INC. WHITE PLAINS, NEW YORK

Upjohn

mixed surface infections . . .

Each gram contains 5 mg. neomycin sulfate (equivalent to 3.5 mg. neomycin base).

Available: Ointment in ½ oz. and 1 oz. tubes, and 4 oz. jars. Cream in ½ oz. tubes.

The Upjohn Company, Kalamazoo, Michigan

Myciguent

Trademark Reg. U. S. Pat. Off.

CREAM OR OINTMENT

Now, as in 1805 when British Prime Minister William Pitt faced the Napoleonic menace, the free world confronts a colossus intent upon its destruction. Before such titanic threats, and the effort necessary to meet them, men falter—as even the great Pitt finally faltered—and fall into the varied psychic patterns grouped together by present-day physicians under the term "depression".

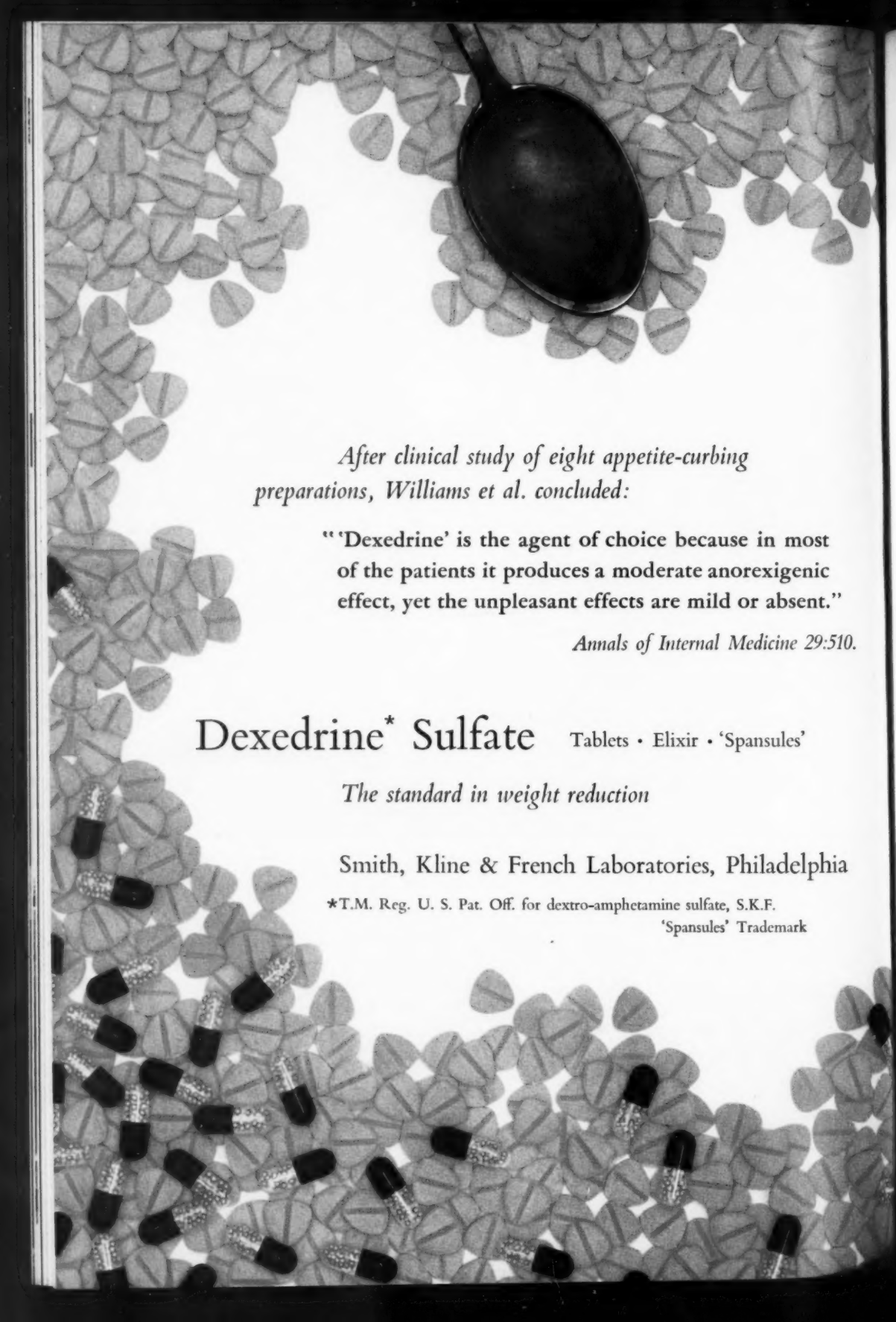
You will find—as countless physicians have—that 'Dexedrine' Sulfate will help the depressed patient. By restoring mental alertness and optimism, by inducing a feeling of energy and well-being, by relieving tensions, 'Dexedrine' can lift your patient from depression and help restore him to an effective place in society.

Dexedrine* Sulfate the antidepressant of choice

Tablets • Elixir • 'Spansules'

Smith, Kline & French Laboratories, Philadelphia

*T.M. Reg. U.S. Pat. Off. for dextro-amphetamine sulfate, S.K.F. 'Spansules' Trademark



After clinical study of eight appetite-curbing preparations, Williams et al. concluded:

"'Dexedrine' is the agent of choice because in most of the patients it produces a moderate anorexigenic effect, yet the unpleasant effects are mild or absent."

Annals of Internal Medicine 29:510.

Dexedrine* Sulfate

Tablets · Elixir · 'Spansules'

The standard in weight reduction

Smith, Kline & French Laboratories, Philadelphia

*T.M. Reg. U. S. Pat. Off. for dextro-amphetamine sulfate, S.K.F.
'Spansules' Trademark

1 *to escape pollens*

2 alternatives for the hay fever patient

2 *to relieve symptoms*

Pyribenzamine®

hydrochloride
(tripelennamine hydrochloride Ciba)

Once atop Pike's Peak, your hay fever patient can enjoy freedom from pollens. But for patients who must remain in a high-pollen environment, you can institute this effective therapy: one or two Pyribenzamine tablets, 3 or 4 times daily.

Alone and as an adjunct to desensitization, Pyribenzamine has proved effective in relieving hay fever symptoms, as evidenced by thousands of published case reports. On the basis of this evidence, no other antihistamine combines greater clinical benefit with greater freedom from side effects.

For your prescription needs, Pyribenzamine 50 mg. tablets are available in bottles of 100 and 1000 at all pharmacies.

Ciba *Ciba Pharmaceutical Products, Inc., Summit, N. J.*

2/1920M

an improved approach to ideal hypotensive therapy

Low toxicity. The only hypotensive drug that causes no dangerous reactions, and almost no unpleasant ones.

Slow, smooth action. The hypotensive effect is more stable than with other agents. Critical adjustment of dosage is unnecessary. Tolerance to the hypotensive effect has not been reported.

Well suited to patients with relatively mild, labile hypertension. A valuable adjunct to other agents in advanced hypertension.

Bradycardia and mild sedation increase its value in most cases. Symptomatic improvement is usually marked.

Convenient, safe to prescribe

The usual starting dose is 2 tablets twice daily. If blood pressure does not begin to fall in 7 to 14 days, and the medication is well tolerated, the dose may be safely increased. Should there be a complaint of excessive sleepiness, the dose should be reduced. Some patients are adequately maintained on as little as one tablet per day.

Dosage of other agents (veratrum or hydralazine) used in conjunction with Raudixin must be carefully adjusted to the response of the patient. If Raudixin is added to another maintenance regimen, the usual dose is applicable, and it is often possible to reduce the dose of the other agent or agents.

Supplied in tablets of 50 mg., bottles of 100 and 1000.

SQUIBB

RAUDIXIN
SQUIBB RAUWOLFIA SERPENTINA
Tablets

'RAUDIXIN' IS A TRADEMARK

the weak

can

become

strong

again

When asthenia is due to adrenal cortical insufficiency in Addison's disease, or to hypofunction following acute infections, CORTATE (Desoxycorticosterone Acetate U.S.P.) will correct major adrenal metabolic alterations and restore strength.

CORTATE is usually administered by intramuscular injection or as CORTATE Buccal Tablets. Buccal administration is not only simple, convenient, and inexpensive, but approaches parenteral administration in efficiency. For long term treatment, CORTATE Pellets may be implanted.

CORTATE

Schering CORPORATION
BLOOMFIELD, N. J.

CORTATE

SCHERING

HYPERTENSION SYNDROME

requires

coordinated medication

Semhyten Capsules provide that coordinated effect:

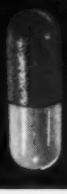
CAPILLARY PROTECTION
— with rutin, and vitamin C.
Rutin, isolated from buckwheat, tends to stabilize the permeability of capillaries. The addition of vitamin C enhances rutin's effectiveness in maintaining intracellular or connective tissue function.

DIURESIS
— with theophylline. Maintains kidney function and aids in neutralizing water retention. Also has a dilating effect upon coronary arteries.

SEDATION
— with phenobarbital. Long-acting protection from emotional disturbance.

VASODILATION
— with mannitol hexanitrate.
Produces slow fall of systolic pressure for periods of 4 to 6 hours in normal dosages. Minimizes unpleasant symptoms of too rapid fall in blood pressure.

Each Semhyten Capsule contains:



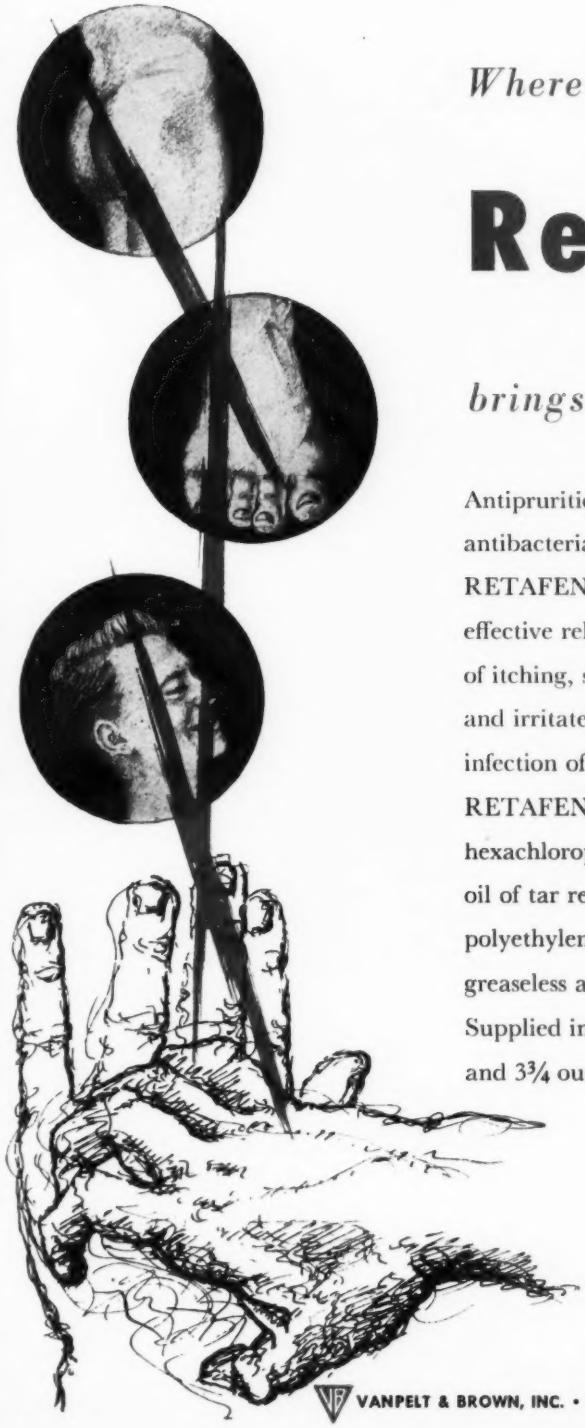
Mannitol Hexanitrate . . . . . ½ gr. (30 mg.)
Theophylline . . . . . 1½ gr. (0.1Gm.)
Phenobarbital . . . . . ¼ gr. (15 mg.)
Rutin . . . . . 10 mg.
Ascorbic Acid . . . . . 15 mg.

Semhyten®

● **Would you like additional information and samples? Write to:**

The S. E. MASSENGILL Company Bristol, Tennessee

New York San Francisco Kansas City



Wherever it itches

Retafen®

brings relief . . .

Antipruritic,
antibacterial, antifungal—
RETAFEN acts promptly to provide effective relief from the nagging torment of itching, soothes and protects inflamed and irritated tissue, and guards against infection of open lesions.
RETAFEN Ointment combines hexachlorophene, phenol, resorcinol, oil of tar rectified and zinc oxide in a polyethylene glycol base—
greaseless and non-staining.
Supplied in 1 ounce tubes and 3¾ ounce jars.

VANPELT & BROWN, INC. • Pharmaceutical Chemists • RICHMOND, VIRGINIA

PROVED EFFECTIVE
in the first 10 million clinical doses

TROCINATE®

(*Brand of Thiphenamil HCl*)

for relief of spasm in the gastro-intestinal tract

Extensive clinical use has proved the effectiveness of Trocinate in relieving pain and other distressing symptoms associated with spasm—anywhere in the gastro-intestinal tract.

Outstanding freedom from side effects permits the use of realistic and effective doses, administered as frequently as required.

SUPPLIED in pink tablets containing 100 mg. Trocinate hydrochloride, and in red tablets containing 65 mg. Trocinate hydrochloride and 15 mg. Phenobarbital—both in bottles of 40 and 250 tablets.

AVERAGE DOSE is usually 2 tablets three or four times a day for the first week, then 1 tablet three or four times a day to maintain improvement.

Wm. P. Poythress & Co., Inc. Richmond 17, Virginia

A product of Poythress research, Trocinate is diethylaminoethyl-diphenylthioacetate hydrochloride—a potent, nontoxic synthetic antispasmodic with both atropine-like and papaverine-like spasmolytic effects.

To give you fine-quality motion-picture records

with ease and convenience . . .

Complete line of Kodak Photographic Products for the Medical Profession includes: cameras and projectors for slides and motion-pictures; film—full color and black-and-white (including infrared); papers, processing chemicals; microfilming equipment and microfilm.

Now, with the Cine-Kodak Royal, you can make superb black-and-white or full-color motion pictures as easily as ordinary snapshots. And the Royal is capable of a variety of effects, can handle a wide range of situations.

Consider these facts: Cine-Kodak Royal takes film in magazines, loads in 3 seconds. Its three-way exposure lever permits normal operation and it can be locked in running position or set for single-frame exposure for animation, special titles, etc. There are three speeds including real slow motion. The enclosed optical finder has parallax indicators to show the field covered with standard, wide-angle, or any of eight telephoto lenses which magnify subjects as much as six times—let you get in close on difficult subjects.

Accessories include a Focusing Finder to permit through-the-lens subject viewing for ultra-precise composition; Cine-Kodak Lens Spacer Rings for greatly magnified pictures of subjects as small as ½ inch.

Two models: with *f*/2.8 Kodak Cine Ektanon Lens, $147.50; with *f*/1.9 Kodak Cine Ektar Lens, $176.25. Prices are list, include Federal Tax, and are subject to change without notice.

For further information see your Kodak photographic dealer or write:

EASTMAN KODAK COMPANY, *Medical Division*, Rochester 4, N. Y.

Serving medical progress through Photography and Radiography.

Kodak
TRADE-MARK

New

LACTINEX TABLETS

For gastrointestinal disturbances, particularly diarrhea, including those resulting from antibiotic therapy.

'Lactinex' Tablets contain a standardized viable mixed culture of Lactobacilli acidophilus and bulgaricus.

'Lactinex' Tablets are highly effective in re-establishing normal physiology in gastrointestinal disturbances when prescribed in dosages of 2 to 4 tablets three or four times a day with at least one half glass of milk.

Supplied in bottles of fifty tablets.

HW&D

HYNSON, WESTCOTT & DUNNING, INC., Baltimore 1, Maryland

SOUTHERN MEDICAL JOURNAL
JOURNAL OF THE SOUTHERN MEDICAL ASSOCIATION
PUBLISHED MONTHLY BY THE SOUTHERN MEDICAL ASSOCIATION AT BIRMINGHAM, ALA.

Volume 46 JUNE 1953 Number 6

FIBROUS LESIONS OF BONE*

By JOHN P. ADAMS, M.D.†
and
J. LEONARD GOLDNER, M.D.‡
Durham, North Carolina

This is a study of certain fibrous lesions of bone and of the existing difficulty in classifying these lesions. Particular attention is given to non-osteogenic fibroma, ossifying fibroma, and monostotic fibrous dysplasia. The unicameral bone cyst will be considered. The less common lesions of neurilemmoma, chondromyxoid fibroma, and hyperparathyroidism will be discussed.

(I) *Pathogenesis.*—Non-osteogenic fibroma, named and described by Jaffee and Lichtenstein[12] was thought by these authors to represent a benign fibrous neoplasm arising in the metaphyseal region as a result of stimulation to pre-existing connective tissue stroma. That these lesions arise from a metaphyseal fibrous defect has been proposed by Hatcher.[8 9] He suggests the existence of a circulatory dysfunction in order to account for their genesis since certain changes thought to be produced by interference with nutrition, such as osteochondrosis, were found in extremities exhibiting metaphyseal bone defects. Sontag and Pyle[22] supported these observations when they described the appearance of metaphyseal defects *(Fig. 1)* in the distal femoral epiphyses of growing children. These lesions, seen on routine roentgen examination, were asymptomatic and found to regress spontaneously.

On the other hand, monostotic fibrous dysplasia and ossifying fibroma are believed to represent a true dysplasia of physiological ossification.

(II) *The Histology and Roentgen Appearance of Fibrous Lesions.*— (1) Non-osteogenic fibroma *(Fig. 2A)* (fibroxanthoma or fibrous metaphyseal defect) when seen on the roentgenogram is usually eccentric in location, but may extend across the shaft. It is always on the metaphyseal side of the epiphysis with a peripheral scalloped border of greater density than the contiguous normal bone. Osteolysis may have occurred, giving the bone the appearance of having been expanded and thinned considerably. This leads to infractions and even gross fractures in some locations.

The gross pathology of these lesions shows them to be firm in consistency, brown to yellow in color, and smooth when cut. The stroma *(Fig. 2B)* is composed of spindle shaped cells that usually show no particular pattern, but may be arranged in whorls. The cellular detail is identified by giant cells, lipoid laden monocytes, and other phagocytes filled with hemosiderin. The proportionate number of phagocytes laden with either lipoids (yellow)

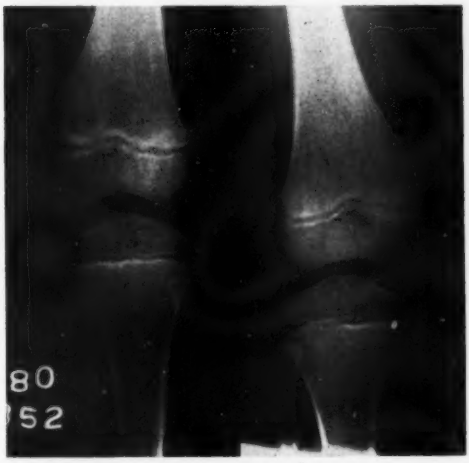


FIG. 1

Roentgenogram of a typical metaphyseal defect in the distal femoral epiphysis in a growing child. Note the eccentric location in the medial femoral condyle. These lesions regress spontaneously and do not require surgical intervention.

*Read in Section on Orthopedic and Traumatic Surgery, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

†Orthopaedic Fellow, Duke University-Georgia Warm Springs Foundation Training Program, National Foundation for Infantile Paralysis, Duke Hospital, Durham, North Carolina.

‡Assistant Professor, Orthopaedic Surgery, Duke University School of Medicine, Durham, North Carolina.

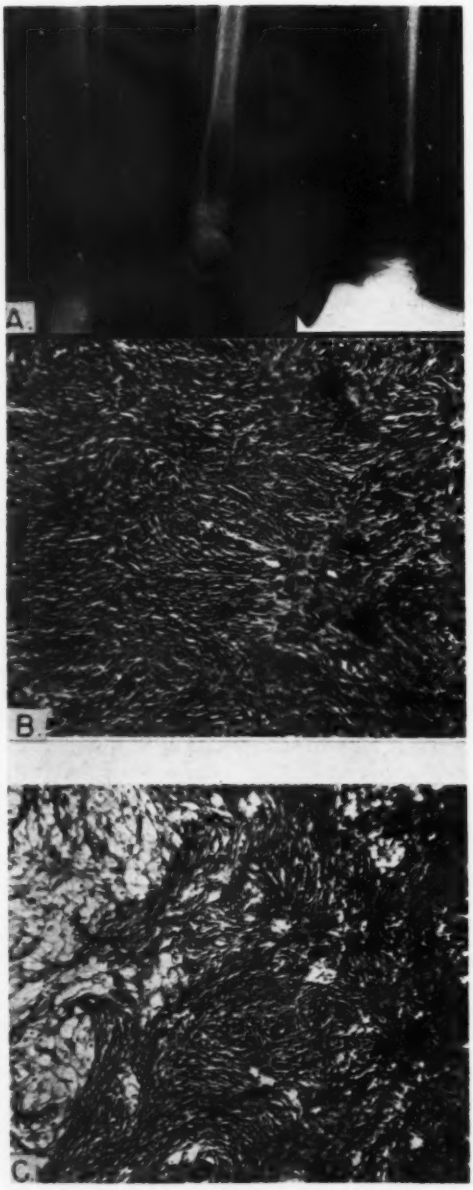


FIG. 2

(A) Non-osteogenic fibroma (fibroxanthoma). Non-osteogenic fibrous lesions are seen frequently in this particular region of the tibia. Note the pathologic fracture, the eccentric location in the metaphysis, the scalloped sclerotic margins on the medial side and the thinning of the cortex. On the right, the lesion has been excised and the cavity filled with bone chips. Healing occurs without difficulty.

(B) Histologic section from the lesion in *Figure 2* (A). The abundance of hemosiderin would give this a brown appearance grossly.

(C) Large numbers of lipoid laden macrophages are present. Grossly this particular lesion would be yellow in appearance in distinction to the brown color described in (B).

or hemosiderin (brown) is responsible for the gross color of the lesion. Young bone trabeculae were not described by Jaffee and Lichtenstein[12] in their original article on non-osteogenic fibroma. New bone formation was mentioned by Schlumberger.[19] This present study tends to corroborate his findings. A biopsy *(Fig. 2C)* taken from another patient with this same bone pathology was yellow in color. The abundance of lipoid laden macrophages accounts for this appearance.

FIG. 3

(A) Monostotic fibrous dysplasia. Note the ground glass appearance of the distal tibial bone lesion. The cortex is beginning to expand and it is thinned on the medial aspect. The periphery of the lesion is slightly irregular and of less density than the central portion. The grayish, gritty material has been excised surgically and bone chips have been used to fill in the defect. On the right, adequate healing has taken place and the trabeculations are assuming their normal stress pattern.

(B) The crescent shaped spicules of bone surrounded by a moderately dense stroma represent the typical histology seen in this particular lesion. Occasionally fibrous tissue is seen alone without evidence of bone. The stroma is usually not so dense as that found in the non-osteogenic fibroma.

(2) *Fibrous Dysplasia.*—The roentgenogram of monostotic fibrous dysplasia *(Fig. 3A)* shows the bone change to be in the metaphysis and diaphysis, usually some distance from the epiphysis. The cortex may be expanded and thinned. Fine trabeculations are frequently evident. The term "ground glass" is used to distinguish the appearance of these lesions from other bone defects. The margins of the less dense region are regular and well delineated. The gross material in fibrous dysplasia is firm, dark yellow or slightly gray in color, and has a "gritty" feeling when cut *(Fig. 3B)*. Spindle shaped connective tissue cells which predominate the stroma are arranged characteristically in whorls. Giant cells may be seen throughout. Spicules of bone which are formed by direct metaplasia may have a sickle shape or fragmented appearance. The bone is usually immature and may be surrounded by osteoblasts. Some areas may show only fibrous tissue without evidence of bone.

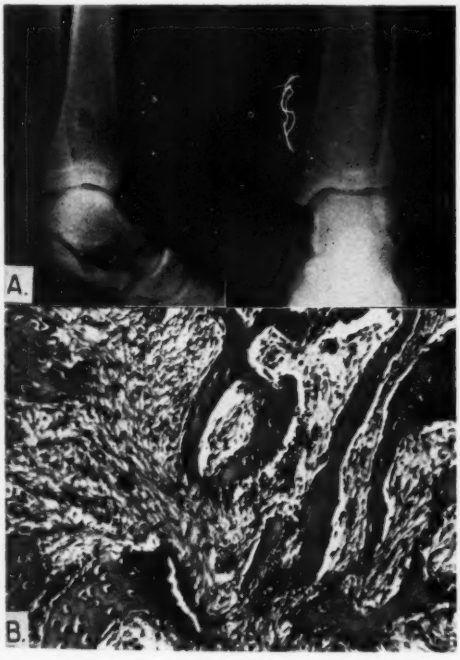


FIG. 4

(A) Ossifying fibroma. The location of this particular bone defect is similar to that of a non-ossifying fibroma. The clover-leaf margin is similar to that seen in *Figure 2* (A). The lateral cortex has been thinned by the expanding tissue. (B) The stroma in this area is more dense than that seen in fibrous dysplasia. The bone fragments are spheroid rather than sickle shaped. Osteoblasts are more abundant. The cellular pattern is somewhat different but the composition is the same as that seen in fibrous dysplasia.

(3) *Ossifying Fibroma.*—The existence of ossifying fibroma *(Fig. 4A)* in long bones is debated. These are found most frequently in the jaw. The roentgen and histologic picture of long bone lesions called ossifying fibroma may be indistinguishable from non-osteogenic fibroma or fibrous dysplasia. Ossifying fibroma *(Fig. 4B)* has, when compared with fibrous dysplasia, fewer giant cells and more mature bone which tends to be spheroid in shape.[16] Even these differences seem to be minor variations in a common histological pattern.[21]

(4) *Hyperparathyroidism.* — The bone

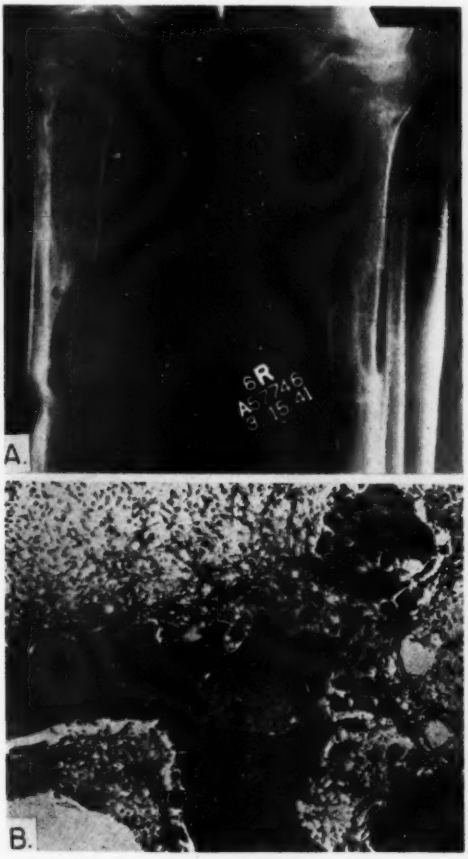


FIG. 5

(A) Hyperparathyroidism. Extreme bone destruction has occurred. The osteolytic area has a smooth margin with the cortex completely destroyed and replaced by an expanding soft tissue tumor. The thin trabeculae are obvious throughout the entire shaft.

(B) The osseous tissue is gradually becoming absorbed. Osteoblasts are noted and Howslip's lacunae are seen around the periphery of the thin bone spicules (courtesy Luck, J. V.: Bone and Joint Disease. Springfield, Ill.: Charles C. Thomas, Publisher, 1950).

changes in this general disease at a certain stage may resemble the preceding lesions on roentgen *(Fig. 5A)* and microscopic examination *(Fig. 5B)*. The trabeculae are thin and surrounded by giant cells in Howslip's lacunae.[19] The stroma is predominantly spindle cells. The diagnosis must be established on the basis of the general distribution of the lesions and the blood chemistry.[1]

(5) *Chondromyxoid Fibroma.*—This entity *(Fig. 6A)*, while presenting a roentgenogram somewhat similar to the other fibrous lesions, is distinguished by the histologic picture *(Fig. 6B)*. Connective tissue cells resembling immature fibroblasts are found to lie in a myxoid matrix interspersed with collagen fibers. In certain areas, cartilage cells are found in lacunae and occasional giant cells may be scattered throughout the stroma.[13 14]

FIG. 6

(A) Chondomyxoid fibroma. The anterior cortex shows a central area of decreased density in an expanding lesion which is sclerotic at its margins. The tumor itself appears spheroid. There are no obvious trabeculae in the central portion of the tumor. On the right, postoperative x-ray after the tumor has been completely excised and the defect filled with bone chips.

(B) There are collagen fibers in the myxoid matrix. Cartilage cells are noted. This tissue has much less fibrous tissue in it than the ones already described.

(6) *Neurilemmoma.*—This tumor is related at least in appearance to those in the fibrous group *(Fig. 7B)*. It shows a myxomatous ground substance, wavy nuclei, fibrillated connective tissue which is palisaded.[4 5] These features separate this particular lesion from the other connective tissue growth. The roentgenogram *(Fig. 7A)* shows the defect to have discrete borders with very little tendency to expansion of cortex.[7]

(7) *Unicameral Bone Cyst.*—The unicameral cyst of bone *(Fig. 8A)* is located on the metaphyseal side of the epiphysis.[11 20 23] It has been suggested that the farther away the

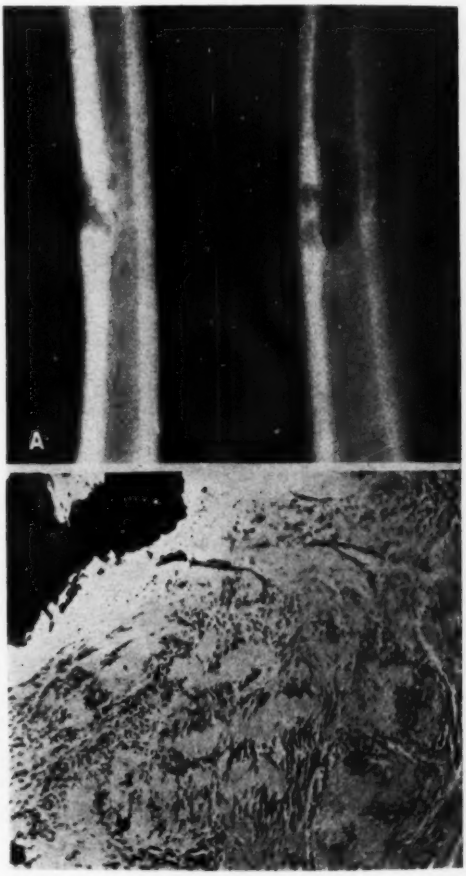


FIG. 7

(A) Neurilemmoma. The roentgenogram may be ovoid with distinct uniform borders. The surrounding bone appears normal.

(B) The fibrous cells, the fibroblasts, and connective tissue cells are arranged in a wavy pattern and palisaded (courtesy Gross, P.; Bailey, F. R.; and Jacox, H. W.: Primary Intramedullary Neurofibroma of the Humerus. Archives of Pathology, **28**:716, 1939).

lesion is from the epiphysis, the less active the growth is and the less tendency there is for recurrence if the area is excised.[11 23] Incomplete excision of the lesion when it is close to the epiphysis may account partially for this. The roentgenographic appearance is highly suggestive of the pathology involved, but not always diagnostic. The bone cyst is usually seen in the proximal humerus or femur. The lesion is an expanding one with thinning of the cortex and trabeculations around the margin which are less dense and less obvious than those seen in fibrous dysplasia. Grossly, the cyst is filled with hemorrhagic or yellow fluid, a few peripheral trabeculations, and the cavity itself is lined with fibrous tissue. Microscopically *(Fig. 8B)*, the lining shows a few layers of fibroblasts along with occasional giant cells.[11] *Figure 9* shows the similarity between a non-osteogenic fibroma of the tibia and an infected bone cyst of the humerus which is healing spontaneously after surgical drainage and curettage.

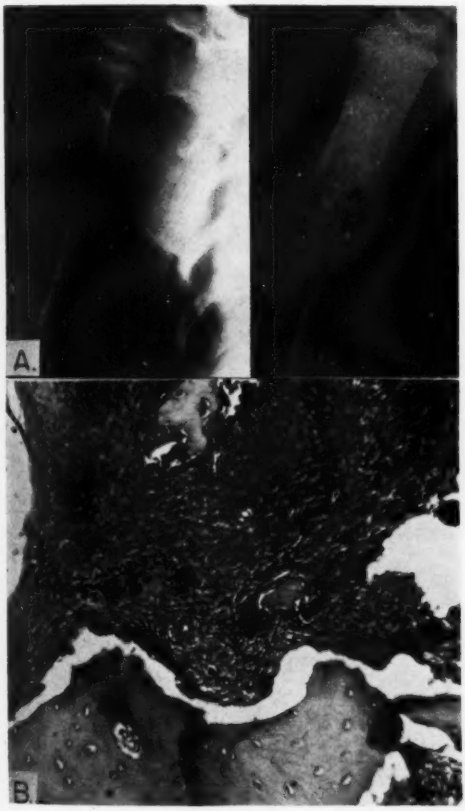


FIG. 8

(A) Unicameral bone cyst. The medial and lateral cortex are thin, and the central portion of the bone defect has a ground glass appearance and appears to be expanding. The characteristics of this bone defect are similar to those seen in *Figure 3* (A). These lesions do not heal spontaneously.

(B) A layer of cortical bone is at the lower margin of the section. Just above that is the cyst lining made up of dense spindle cells interspersed with giant cells and fragments of mature bone.

(III) *Case Report of Multiple Non-Osteogenic Fibromata.*—The patient, a seven-year-old white girl, was referred following the discovery of multiple osseous changes in the lower extremities. The child's initial complaint was left knee pain of a few weeks' duration. The roentgenogram revealed bone change in the distal femur and proximal tibia *(Fig. 10)*. More extensive roentgen examination showed a total of seven discrete lesions distributed in the lower extremities, being present in both trochanteric regions, in the distal femoral metaphysis, bilateral, the proximal tibia, bilateral, and the distal tibia on the left *(Figs. 11A, B, C)*. A complete bone survey did not reveal other lesions. The physical examination was physiologic except for slight enlargement of the distal third of the left thigh.

The blood serum calcium was 9.9 mg. per cent, the phosphorus was 4.4 mg. per cent, and the alkaline phosphatase was 3.7 Bodansky units. All other peripheral blood studies, as well as the urinalysis, were within normal limits. All of the tibial lesions, as well as those in the distal end of the femurs, were removed, and the defects packed with homogenous bone. It was noted at the time of surgery that the posterior cortex of the proximal tibial and distal femoral lesions was broken. The material taken from the distal tibial lesion on the left *(Fig. 12A)* and the distal femur and proximal tibia on the right was golden-brown in

FIG. 9

Healing bone cyst compared with non-osteogenic fibroma. A proven non-osteogenic fibroma of the tibia (right) is similar in all respects on the roentgenogram to a previously infected unicameral bone cyst of the humerus (left) drained surgically and healing spontaneously. No bone graft has been added to the humerus.

color. The substance removed from the distal left femur and proximal left tibia was a bright tobacco yellow *(Fig. 12B)*. The microscopic appearance of these lesions conforms to the description made by Jaffee and Lichtenstein[10 12] in every respect except that new bone formation was seen in sections from all of these areas.

The lesions in this patient are unique in that a similar case with areas of this size and number has not been recorded in the literature. In most aspects, the bone changes observed come under the category of non-osteogenic fibroma. The histological pattern conforms to their description with the exception of the areas of new bone formation. The presence of bone in this non-ossifying lesion may be explained partially by the fact that the cortex had been broken and a physiological reaction to trauma was taking place by production of reactive bone. On the other hand, this bone shows a pattern similar to that seen in fibrous dysplasia. Schlumberger[19] and others [17] have pointed out previously the existence of bone formation in some of the entities otherwise designated non-osteogenic fibroma. This implies a relationship between monostotic fibrous dysplasia and non-ossifying fibroma. The multiplicity of bone changes in this particular patient would tend to support the theory of multiple metaphyseal circulatory defects. The existence of bone defects of this size is similar in pattern to Ollier's disease where the alterations are considered to be neoplastic but which arise from an inherent defect rather than a metaplastic process. The absence of fibrous bone defects in the trunk and upper extremities would be one objection to making this comparison. The presence of metaphyseal defects in this patient's younger brother *(Fig. 1)* may bear no relationship to the origin of the fibrous changes, but at least the occurrence is interesting. Again, they probably represent the changes described by Sontag and Pyle.[22]

The fact that five of the pathologic areas in this particular child have been excised and

FIG. 10

Non-osteogenic fibroma, multiple lesions, tibia and femur. There is a soap bubble appearance with thinning of the cortex and involvement of the entire metaphysis. The posterior cortex is expanding and has fractured.

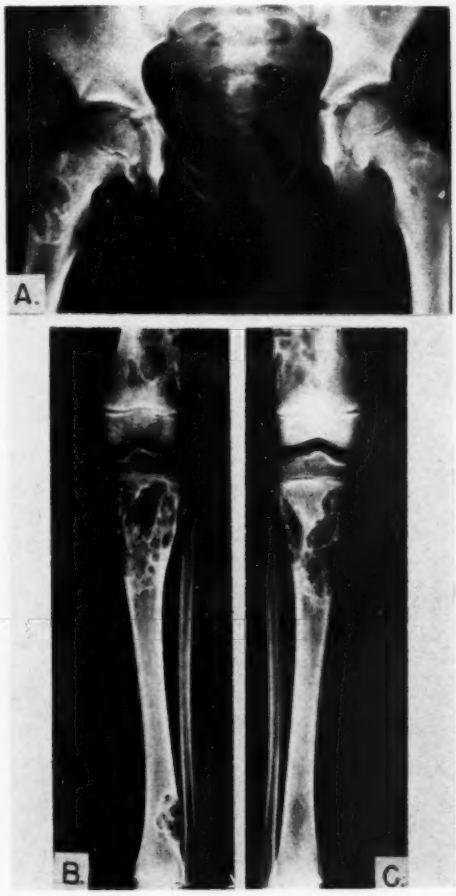


FIG. 11

(A) Non-osteogenic fibroma, multiple bones. This is a trochanteric region showing a large bone defect in the upper left femur and a less obvious defect in the central portion of the right femur just opposite the lesser trochanter. These lesions occurred in the same patient whose roentgenogram is seen in *Figure 11* (B) and (C).

(B) The left lower extremity showed lesions on either side of the knee joint as well as in the distal shaft of the tibia. (C) Non-osteogenic fibroma, multiple lesions. Large defects are noted in the proximal tibia and distal femur in the right lower extremity.

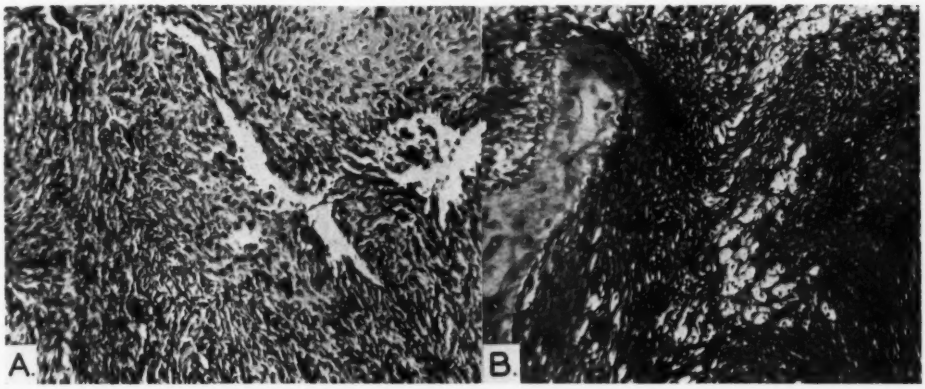


FIG. 12

(A) Non-osteogenic fibroma. This material was removed from the lesion shown in *Figure 11* (C). This is the typical appearance of the lesion as described by Jaffee and Lichtenstein. The fibrocytes are closely packed and arranged in whorls and sheets. A few giant cells are present. No new bone is evident in this particular section. Numerous macrophages with hemosiderin are present.

(B) This particular section was removed from the lesions seen in *Figure 10*. Note the new bone. A great number of lipoid laden macrophages are noted in this particular field although they were not present in all areas. The color of the lesion represented by this section was bright yellow, whereas the color of the tissue seen in *Figure 12* (A) was golden brown.

filled with bone chips, and that two regions have been left intact will give some information in a few years as to what is the natural course of the non-osteogenic fibroma.

SUMMARY

(1) The fibrous lesions discussed are as a rule "silent." They are recognized usually by pathologic fracture, vague discomfort, or by incidental roentgenogram taken for some other complaint. There is no evidence that complete extirpation of all lesions is indicated or necessary. Areas at the site of a fracture and those large enough to produce pain or a potential pathologic fracture should be treated by surgery. The recommended surgical treatment is complete excision of the fibrous tissue and filling of the cavity with bone grafts.

(2) The similarity of the roentgen appearance of all of these lesions precludes an accurate diagnosis by this medium alone.

(3) The presence of new bone seen in particular microscopic fields indicates that non-osteogenic fibroma[12] (metaphyseal fibrous defects,[11] fibroxanthoma[17]), monostotic fibrous dysplasia, and ossifying fibroma may be related entities.

(4) The necessity for accurate and adequate pathologic interpretation is obvious if a reasonable understanding of their pathogenesis is to be established. If the fibrous lesions of bone are subjected to biopsy or excision, adequate material should be made available so that accurate pathologic interpretation is possible. This, in conjunction with clinical findings and periodic roentgen examination may aid in the understanding of their pathogenesis and natural course.

BIBLIOGRAPHY

1. Albright, F.; and Reifenstein, E. C., Jr.: The Parathyroid Glands and Metabolic Bone Disease. Baltimore: Williams and Wilkins Co., 1948.
2. Baker, L. D.: Personal communication.
3. Brunschwig, A.: Solitary Cysts of Long Duration. J. Bone and Joint Surg., **12**:141, 1930.
4. Conley, A. H.; and Miller, D. S.: Neurilemmoma: Case. J. Bone and Joint Surg., **24**:684 (July) 1942.
5. DeSanto, D. A.; and Burgess, E.: Primary and Secondary Neurilemmoma of Bone. Surg., Gyn., and Obst., **71**:454, 1940.
6. Geschickter, C. F.; and Copeland, M. M.: Tumors of Bone. Philadelphia: J. B. Lippincott Co., 1949.
7. Gross, P; Bailey, F.R.; and Jacox, H. W.: Primary Intramedullary Neurofibroma of the Humerus. Arch. Path., **28**:716, 1939.
8. Hatcher, C. H.: The Pathogenesis of Localized Fibrous Lesions in the Metaphyses of Long Bones. Ann. Surgery, **122**:1016, 1945.
9. Hatcher, C. H.: Personal communication.
10. Jaffee, H. L.: Personal communication.
11. Jaffee, H. L.; and Lichtenstein, L.: Solitary Unicameral Bone Cyst with Emphasis on the X-Ray Picture, Pathology and Pathogenesis. Arch. of Surg., **44**:1004, 1942.
12. Jaffee, H. L.; and Lichtenstein, L.: Non-Osteogenic Fibroma. Amer. J. Path., **18**:205 (March) 1942.
13. Jaffee, H. L.; and Lichtenstein, L.: Chondromyxoid Fibroma of Bone. Arch. Path., **45**:541 (April) 1948.
14. Lichtenstein, L.: Bone Tumors. St. Louis: C. V. Mosby Co., 1952.
15. Luck, J. M.: Bone and Joint Diseases. Springfield, Ill.: Charles C. Thomas, Publisher, 1950.
16. Mannel, C. K.: Histological Comparison of Localized Fibrous Dysplasia of Bone and Ossifying Fibroma. J. Oral Surg., **6**:27, 1948.
17. Penninger, W. H.: Fibroxanthoma of Bone. Correspondence Club, Orthopaedic Division, Department of Surgery, Duke University School of Medicine and The Army Institute of Pathology, Jan. 1950.
18. Ponseti, I. V.; and Friedman, B.: Evolution of Fibrous Metaphyseal Defects. J. Bone and Joint Surg.,**31A**:582, 1949.
19. Schlumberger, H. G.: Fibrous Dysplasia of Single Bones. Military Surgeon, **99**:504, 1946.
20. Silver, D.: The So-Called Benign Cyst of the Bones. Amer. J. Orthopaedic Surgery, **9**:563, 1912.
21. Smith, A. G.: Personal communication.

22. Sontag, L. W.; and Pyle, S. I.: The Appearance and Nature of Cyst-Like Areas in Distal Femoral Metaphyses of Children. Amer. J. Roentgenol., 46:185, 1941.
23. Stewart, M. J.; and Hamel, M. A.: Solitary Bone Cyst. Sou. Med. J., 43:923 (Nov.) 1950.

DISCUSSION *(Abstract)*

Dr. Paul Thompson, Chattanooga, Tenn.—The lesion under consideration is probably the commonest benign bone lesion, but is known by many different names. As previously stated, Jaffee and Lichtenstein are of the opinion that the lesion is a benign connective tissue tumor, while Schlumberger considers it a variant of fibrous dysplasia. Geschickter and Copeland regard the osteolytic defect as a variant of giant cell tumor, which is generally accepted as a tumor occurring in adults. Hatcher does not regard the lesion as a true tumor, but as resulting from a disturbance at the epiphysis. The fibroxanthoma occurs frequently in the second decade before closure of the epiphysis and on clinical, x-ray and microscopic examination does not appear to be related to the genuine giant cell tumor. Nor does the lesion appear to be related to fibrous dysplasia when one considers the very characteristic x-ray and microscopic appearance of the fibroxanthoma. Hatcher, Ponseti and others have reported cases showing multiple bone involvement in which spontaneous regression or healing occurred.

Another fibrous lesion of bone producing erosion of the outer cortex, not mentioned by the authors, was described by Kimmelstiel and Rapp in 1951 and named periosteal desmoid. The authors reported a series of five cases and what appears to be a separate distinct entity not previously recognized.

I should like to report a somewhat unusual case demonstrating multiple fibrous lesions with an associated scoliosis. The patient was a 17-year-old white man who was first seen in our office in September 1948 with x-rays showing a very small cystic area in the distal one-third of the right tibia. A skeletal review at this time revealed no other lesions. Two years and nine months later in May, 1951, x-rays revealed a marked increase in the size of the tibial lesions showing the characteristic eccentrically placed osteolytic multi-loculated fibroxanthoma. X-rays of the right tibia showed a new lesion in the upper metaphyseal area, and films of the spine revealed moderate scoliosis with osteolytic changes apparent in the fourth and fifth lumbar vertebrae on lateral view and second and third lumbar vertebrae on an antero-posterior view. The lower tibial lesion was surgically excised, but the upper metaphyseal lesion was not detected until a recent review of the films. Unfortunately follow-up films on this lesion have not yet been obtained.

Observations of this and other cases would suggest that the natural course of the non-osteogenic fibroma should be divided into two separate phases which in turn denotes its non-neoplastic nature. Bone destruction by connective tissue proliferation constitutes the active phase and spontaneous regression by osseous metaplasia its healing phase. Pathological material is unually obtained from patient's presenting symptoms caused by the active phase of the disease. For this reason the predominant microscopic picture is that of proliferating fibrous tissue and not that of bone formation as would be seen in the healing phase. Hatcher has shown the frequency of osteochondritis dissecans and Osgood-Schlatter's disease associated with this lesion. Still another osteochondritis involving the spine has been seen in two patients which may be associated with the non-osteogenic fibroma. A skeletal survey of all cases of fibroxanthoma would probably reveal a high instance of multiple defects and further insight into the etiology of this lesion might be obtained.

Dr. Lent C. Johnson, Washington, D. C.—For about ten years there has been a tendency to lump all fibrous lesions of bone under the term, fibrous dysplasia. In the last few years there has been a growing feeling on the part of many physicians that the lumping process has been carried too far and that the entities must be separated again into their individual components. The individual components are apparent at both x-ray and clinical levels but are most pronounced at the histologic levels.

Dr. Adams and Dr. Goldner have discussed some seven entities in this group, including bone cysts. We are inclined to follow Dr. Granville Bennett's classification, and use as a generic term for the entire group, fibrocystic disease of bone. There would be two major categories under this heading, those which are bone cysts as defined by the presence of a cavity containing fluid or air, and those which are spaces within bone filled with solid material of a fibrous nature. In our studies on the material in the Registry of Orthopedic Pathology at the Armed Forces Institute of Pathology, the cases that fall into the category of true bone cyst seem to represent three or four different entities. More important from the standpoint of today's presentation is the fact that in the fibrous group there seems to be somewhere between six and ten entities depending upon how any individual author divides the group: and this is apart from hyperparathyroidism which is a generalized bone disease. Furthermore, I am not yet willing to include neurilemmoma among the group, having so far failed to see any case which would meet the rigid criteria of a neurofibroma or a neurilemmoma in bone.

There is no point in comparing the details of individual classification's but the attempt to redivide the group into its component parts, as represented by this paper, should certainly be continued and the details should be worked out clearly by further study.

Dr. Goldner (closing).—The field of bone pathology is already full of repetitions and confusing terms. Certain entities have acquired several names. Let us attempt to keep the terminology simple and remove the aura of secrecy from this particular facet of orthopedic pathology. We must, at least for the present, be plagued with the names fibrous dysplasia, non-osteogenic fibroma, ossifying fibroma, metaphyseal defect, fibroxanthoma and chondromyxoid fibroma. Let us not forget that these entities are related.

We should know how closely they are related and what kind of a spectrum they make. Only by adequate biopsy, numerous opinions, and centralized collection of the material will we be able to see the pathology as it really is.

THE RESULT OF PRIMARY BLOCK RESECTION IN BONE TUMORS*

By ALBERTO INCLAN, M.D.
and
PEDRO LEON, M.D.
Havana, Cuba

It is our aim to present our experiences with the surgical treatment of tumors of bone by primary block resection of the tumor mass and surrounding normal bone, followed or not by the implantation of a massive bone graft to fill the resulting defect.

For many years one of us (Inclan) has advocated this type of treatment as a possible way of obtaining a cure in selected cases of benign, borderline, and even malignant bone tumors. Some of our patients so treated have been followed over a long period of time, so that we are now able to evaluate the late results of their treatment. We hope that this report may be of interest to you.

We are all aware of our limitations in the treatment of bone tumors, but there are certain facts upon which there is general agreement, namely: that bone tumors should be treated by early surgical removal, either by local excision or even amputation when malignancy has been proven, and that on rare occasions deep x-ray therapy may be advisable as curative treatment.

It is sometimes difficult to arrive at a positive diagnosis of bone malignancy, and yet the diagnosis must be made before a surgeon may recommend the performing of a radical, mutilating operation. Even the patient or his relatives will often object to the performance of such an operation, though the surgeon's advice may appear sound and properly established. In many cases biopsy is greatly delayed and much precious time is wasted awaiting the pathologic report before the proper operative procedure is agreed upon.

It seems unnecessary to emphasize the great importance of arriving at an early diagnosis in bone tumors, especially in malignant tumors which require radical surgical treatment. Primary block resection is possible only when our diagnosis is made early enough to permit complete excision of the tumor and adjacent bone, in order to eliminate recurrences and to diminish the danger of metastases. When diagnosis is delayed and the tumor is no longer confined to the bone, invading neighboring soft tissues, complete massive resection is impossible.

Occasionally a thorough clinical and radiologic examination of a patient may reveal a tumor, but unfortunately and far too often, patients with referred pains and even with functional disability are treated with aspirin and other sedatives for their so-called rheumatic or arthritic pains, without a proper clinical investigation. In many cases a pathologic fracture leads to the diagnosis of a tumor which is already of long standing.

Even when clinical symptoms of malignant bone tumors and radiographic signs of malignant disease are well known, there are cases in which a conclusive diagnosis of malignancy is not possible by these methods alone. Many years ago, following the ideas of Drs. Santos and Calda, I advocated anteriography in appropriate cases, for the early differentiation of benign and malignant bone lesions. The positive signs of malignancy are easily seen and consist of the presence of newly formed arteries which show anarchic distribution; visualization of the entire stroma of the tumor by the contrast medium, and the enlarged circulation in the vicinity of the tumor showing also anarchic distribution. It is surprising to see that this method of diagnosis, so freely employed for other conditions, is very seldom used for the early differential diagnosis of bone malignancy. Of course, biopsy, either by aspiration or preferably by resection of part of the tumor is the rule and gives the most conclusive proof as to the character of the lesion and often serves as a guide in deciding the type of therapeutic measure to be employed.

Notwithstanding the very convincing procedures already mentioned, we have followed a somewhat different and perhaps more practical approach to the proper method of treatment of tumoral lesions of bone. After careful clinical and radiographic evaluation of the case, coupled with certain laboratory procedures, we reach certain conclusions regarding diagnosis and treatment, which may be described as follows: the lesion is probably benign, and treatment may consist of excision,

*Read in Section on Orthopedic and Traumatic Surgery, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

block resection, amputation, or x-ray therapy; or the tumor is probably malignant and treatment may consist of massive block resection, amputation, or x-ray therapy.

There are a number of benign bone tumors in which excision is the treatment of choice. Such are: solitary osteochondroma of the pedunculated type; osteomas; multiple exostoses; localized bone cysts; benign giant cell tumors near weight bearing joints. Cases of this type have not been included in the present report. There are others in which, on account of their location, rapid increase in size, multiple pathologic fractures, or the deformity produced by their growth, the best treatment will be block resection with substitution by a massive bone graft. A limited number of patients will even require amputation when recurrence of the tumor or infection interferes with joint function or weight bearing.

We have found segmental resection advisable in the following benign conditions: fibrocystic disease of progressive type; enchondroma; giant cell tumors; osteoid osteoma. In cases in which clinically and radiologically the probability of malignancy is seen to be great, massive bone resection should be considered and even strongly recommended, especially when complete removal of the lesion seems feasible, and when substitution by a massive bone graft or internal prosthesis will allow the preservation of a useful limb. If this is so, we should not wait for other investigations, for its result would not in any case change the type of treatment, which will remain resection of the entire tumor and surrounding normal bone. A soft tumoral mass will allow a pathologic report of a frozen section during the operation. The entire specimen will then be available to the pathologist for subsequent study, of great importance for the prognosis and determination of type of postoperative treatment, for it will afford valuable information as to cell type, grade of malignancy, radiosensitiveness and metastatic power of the tumor.

Undoubtedly we shall find that when this type of treatment is recommended it will be more acceptable to the patient and his relatives than a mutilating operation. This will often result in earlier treatment, because sometimes months pass before the patient makes up his mind to accept an amputation. Block resection is followed by immediate radiation treatment. Unfortunately in the majority of our cases amputation has been the only choice, for the tumor was well advanced, invading the surrounding soft tissues, or neighboring joint, so that a local massive resection was not possible. In such cases preoperative biopsy is indispensable to secure preoperative proof of our diagnosis. In any case, amputation or disarticulation remains the only possible treatment. If due to the location of the tumor or the presence of established metastasis, no type of surgical treatment can be carried out, radiation remains as the only alternative. The cases we are now reporting, still alive after treatment of a malignant bone tumor, are worthy of thought, for it is significant that in all of them the same type of treatment, namely, massive block resection, has been carried out, and that, though small in number, they have survived for a considerably longer time than the long series of cases treated by immediate amputation, in which metastases and death, occurring within four to ten months, has been the rule.

We are reporting seventeen cases of bone tumor in which primary block resection has been carried out.

The time elapsed since the operation fluctuates between two and twenty-three years.

The class of lesion has been benign in nine cases; borderline in four cases and malignant in four cases.

Sex.—Six males and eleven females.

Race.—White, sixteen cases; Negro, one.

Block resection has been performed in: humerus, three times; radices, three times; tibia, three times; fibula, four times; patella, twice; metacarpal, once; phalanx, once.

Osteoplastic repair was carried out in twelve cases: plastic repair with fuscia lata, twice. There was no osteoplastic repair in three cases.

Result.—There was no recurrence in eight of the nine benign cases reported. Recurrence lead to secondary block resection in one case and to amputation in another case, in two of the four cases reported as borderline tumor. Recurrence was observed in two of the four malignant tumors reported requiring secondary amputation. Pulmonary metastasis was observed in one of the borderline tumors and in one of the malignant tumors, two years after primary block resection. In both cases no local recurrence was present. One of these patients is dead; the other one still living after pneumectomy.

Case 1.—P. H., a boy, age 14, was seen for the first time December 17, 1930. During the last year he suffered three pathologic fractures of the left humerus, always on performing abduction of the arm. Fracture was the first symptom of disease. X-rays show a fracture through an area of localized osteitis fibrosa of the upper half of the humerus. After a period of immobilization in an abduction plaster spica, block resection of the lesion with implantation of a massive autogenous bone graft was carried out on February 2, 1931. On February 26, 1932, x-rays showed reconstruction of the humerus without recurrence, and the boy had been using his arm freely. Five years later function in the arm was completely normal and no further fractures had occurred. He has not been seen since.

Case 2.—G. A., a white boy, age 17, was seen on May 9, 1932. He gave a history of having suffered eight fractures of the left humerus in two and one-half years. The first fracture was caused by a fall on the left shoulder. He showed a pathologic fracture of the left humerus through a tumoral lesion involving the upper half of the humerus from the epiphyseal plate distally, with enlargement of the diaphysis and clinical and radiologic signs of localized progressive osteitis fibrosa. After treatment of his last fracture, and due to the numerous fractures sustained, a block resection and osteoplastic repair were carried out on April 15, 1932. We have followed this case well into adult life. There has been no recurrence. There is slight limitation of full abduction and slight shortening.

Case 3.—O. S. P., a girl, age 12, was first seen on August 13, 1936. She had suffered three fractures of the upper third of the left humerus. X-rays showed progressive osteitis fibrosa of the upper half of the humerus. Block resection and osteoplastic repair were performed. Clinically and radiographically the patient was well two years later. There were no recurrences or fractures. She was learning the violin. Though this patient has not been followed into adult life, her course for two years was very similar to the previous cases.

Case 4.—M. Z., a girl, age 12, complained of a large saber shaped deformity of her left leg, with marked enlargement of the whole tibia, very similar to the deformity seen in advanced Paget's disease. There was pain, local increase in temperature, increase in length and diameter of the tibia. X-ray appearance was very similar to Paget's disease, but there was a marked predominance of cystic formations. Radiotherapy was administered without result. The great deformity was a source of considerable worry to this young and very pretty girl. We decided to perform complete block, subperiosteal resection of the entire tibia, using a long, autogenous tibial graft to fill the gap. Steinman pins were passed through the os calcis and supracondylar region of the femur and included in a plaster cast to prevent shortening, and the operation was performed through a large window cut in the cast. The operations were performed in August 1932. Regeneration of the tibia was followed by a great improvement in the aspect of the leg and function of the limb, but on November 5, 1940 recurrence of cystic formations in the lower third of both the fibula and the tibia made necessary a partial resection and wedge osteotomy of the lower third of the tibia, and packing of the cystic area with bone chips. This girl, now married, has been seen by us recently. Though the bone structure is not normal, for some small cystic areas still persist, the leg is used normally, there is no noticeable deformity, and the patient is pleased with the results obtained. We have an old moving picture of her operation and the results obtained which we hope to be able to show you.

Case 5.—A. R., a white woman, age 46, was first seen on February 18, 1937. A year before she began to notice a small, round nodule at the lower end of the fourth metacarpal of her left hand. This tumor had increased in size. There was pain on only one occasion after strenuous effort. A small, hard, non-fluctuating, non-pulsating tumor of the fourth metacarpal was found. This projected dorsally and into the fourth interosseous space. X-rays showed a small, centrally located tumor with expansion of the metacarpal, thinning of the cortex, and some calcified deposits. The articular surface was not affected. Block resection was carried out on February 23, 1937, with tibial graft to fill in the defect. Union resulted with complete functional recovery and no recurrence in fifteen years. The pathological report was chondroma.

Case 6.—E. I. A., a white woman, age 24, was seven months pregnant. In November 1938 she noticed a small tumor of her left wrist. The tumor gradually increased in size, causing slight pain, limitation of motion, and loss of muscular strength. The first roentgenogram and arteriography were positive for giant cell tumor of the lower end of the radius. Deep x-ray therapy was given up to a total of 1400 r. Two months later, when the patient was brought to our service, the tumor had increased in size and there was ulnar deviation of the hand. Slight pain, increase in local temperature and marked limitation of motion at the wrist were present. The next roentgenogram showed marked increase in size of the tumor, with destruction of the epiphyseal external cortex, as well as the articular cartilage. Block resection and bone graft to supplant the bone defect, with implantation of the lower end of the graft into the carpal scaphoid, was done on May 3, 1939. The pathologic report was giant-cell tumor. The specimen revealed great vascularity and hyperchromatism of the stroma cells, suggestive of malignancy. Seven months later, as the result of strenuous effort, a fracture of the graft occurred. A year later the patient had no pain. Good healing of the fracture had been accomplished, but limitation of motion at the wrist and thumb was present.

Case 7.—M. L. G., a white woman, age 24, in February 1939 complained of pain at the lower end of the left forearm. Examination revealed a tumor of the lower end of the left radius which projected anteriorly and posteriorly and showed edema of the surrounding tissues. There were local temperature increase, prominent superficial veins, and limitation of wrist motion. Roentgenograms showed a giant cell tumor of the lower end of the radius with destruction of the anterior cortex and the inferior articular surface of the radius. In an effort to preserve function, a partial resection was done on May 29, 1939, leaving the articular cartilage. In January 1940, eight months after the operation, the patient returned to the hospital with recurrence of the tumor. Radiotherapy resulted in no

improvement. On April 3, 1940 a complete massive resection of the lower end of the radius was carried out, and a bone graft was used to fill the gap. Primary healing was obtained. The pathologic report was: numerous giant cells with abundant nuclei contained within a fibromuscular capsule showing degenerative changes. Numerous giant cells are seen to be contained within a lymphatic vessel. There are hyperchromatism and mitoses of the stroma cells. There was no recurrence. Death occurred two years later from pulmonary neoplasm.

Case 8.—J. S. D., a white man, age 33, in February 1939 noticed pain in the left wrist accompanied by lack of strength and inability to continue his work as a truck driver. Examination a month later revealed a small tumor at the lower end of the left radius, slightly painful under pressure, with marked restriction of wrist motion. Roentgenograms showed a giant-cell tumor of the lower end of the radius with destruction of the anterior aspect of the radial cortex. A block resection of the lower end of the radius was done on July 5, 1939, and a thick tibial graft was inserted into the carpal scaphoid. Primary healing was obtained. Pathologic report was a typical giant-cell tumor, with a few mitotic cells in the stroma and a limited amount of hyperchromatism. In November 1939 the patient was able to return to work with sufficient wrist motion to continue his employment without discomfort or difficulty. This patient was followed for over seven years and remained well.

Case 9.—M. L. Q., a white woman, age 35, in May 1927, fell on her left knee, noticing pain, edema, and functional limitation. The pain was not relieved and a tumor appeared on the anterior aspect of the patella. Examination revealed a painful, enlarged patella forming a tumor of about the size of a small orange. There was redness of the skin and local increase in temperature. Active extension was limited to 160 degrees and flexion was limited and painful. Roentgenograms revealed enlargement of the patella, very thin cortex, and irregular clear spaces suggestive of giant-cell tumor. On May 25, 1929, resection of the tumor was done with plastic repair of the defect with a pedicle flap of fascia lata. The pathologic report was benign giant-cell tumor, complete cure and functional recuperation. This patient was followed for ten years with no evidence of recurrence.

Case 10.—A. B. P., a white woman, age 49, in November 1937 stumbled but did not fall. This accident was followed by pain and edema of the left knee. She was treated for rheumatism with salicylates, without improvement. In April, 1938, a giant-cell tumor of the patella was diagnosed, and curettage with gauze packing for twenty-four hours was carried out at another hospital. Two months later healing was obtained. Radiotherapy was given. Five months after the last treatment, given in December 1939, the patient was experiencing much discomfort and was unable to walk. Great limitation of joint motion was present. The tumor had increased greatly in size and there was involvement of the surrounding soft tissues. There was complete disappearance of the patella. A total resection of the tumor was done, with plastic repair of the patellar defect using a pedicled flap of fascia lata. Functional recovery was fair, and no recurrence took place during a follow-up period of five years.

Case 11.—D. Y., a white boy, age 17, was first seen on July 14, 1944. Two months previously, while playing ball, he received a blow on the right ankle, followed by swelling over the lateral aspect of the ankle. He had pain on touch and on motion of the

FIG. 1, CASE 11

Giant-cell tumor of external malleolus.

FIG. 2, CASE 11

Specimen of tumoral mass after resection.

FIG. 3, CASE 11

Tibial bone graft to substitute for external malleolus one year after resection.

joint. He presented an expansive, slightly elastic tumor of the external malleolus. There was no inflammatory change, and no increase in superficial veins. There was increase in local temperature and pain on pressure. The x-ray showed a typical picture of giant-cell tumor. On July 25, 1944, block resection and tibial graft to substitute for the external malleolus was carried out. Five months with a walking cast was followed by a brace. He was discharged with a very good functional result on May 15, 1951. There was no recurrence. The pathologic report was giant-cell tumor.

Case 12.—J. G., a Negro girl, age 11, came to us because of an increasing saber-like deformity of her right tibia with marked enlargement of the middle third of this bone. Duration of symptoms was two years. Her general health was unaffected. There was a fusiform enlargement of her right tibia, with no inflammatory changes. A scar from a previous biopsy was visible. There was slight pain on palpation. The roentgenograms showed a fusiform enlargement of the tibia and a sclerosing osteitis with a central zone of rarefaction. The diagnosis was osteoid osteoma. On May 15, 1946, block resection was carried out, and a massive graft from the opposite tibia was used to bridge the gap. There has been no recurrence and complete regeneration of the tibial defect through the graft has occurred. The pathologic report was osteoid osteoma.

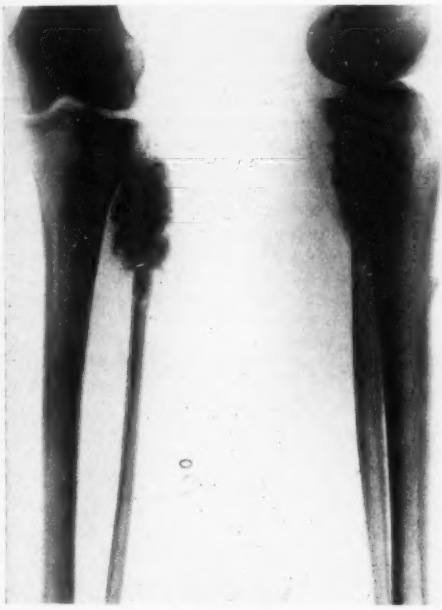


FIG. 4, CASE 14
Osteogenic sarcoma of upper end of right fibula.

FIG. 5, CASE 14
Split section of resected tumor.

MALIGNANT TUMORS TREATED BY PRIMITIVE BLOCK RESECTION

Case 13.—D. R., a white woman, age 19, was first seen at the Mercedes Hospital on April 27, 1937. The patient had been suffering from constantly increasing pain in the upper third of the right leg. There was swelling, localized tenderness, increased temperature and slight prominence of the superficial veins around the upper end of the tibia. The knee joint was not involved. The radiographic diagnosis was sclerosing osteogenic sarcoma limited to the bone. Biopsy was not performed. Massive block resection of the upper end of the tibia, including about four inches of normal bone was performed on April 30, 1937. A groove was cut into the lower articular surface of the femoral

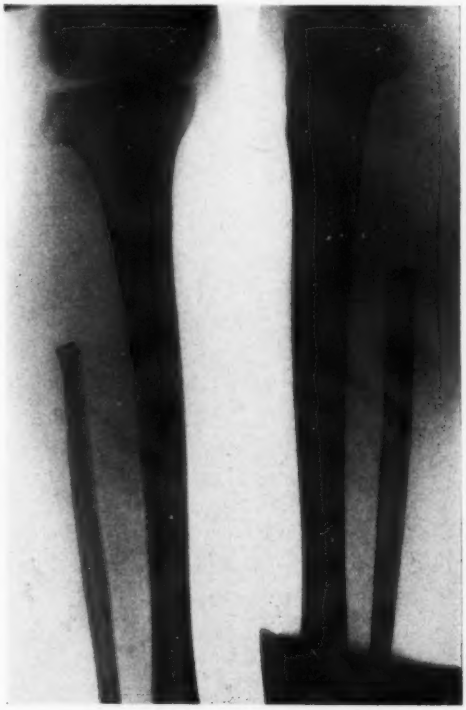


FIG. 6, CASE 14
Block resection. No recurrence two years after operation.

condyles, just behind the patellar groove. The anterior half of the lower portion of the tibia was cut to form a massive graft. Its lower end was implanted into the femur, in the prepared groove, and its upper end into the posterior half of the tibia. The patellar tendon was sutured to the graft. A long circular cast was applied encasing the whole limb. The graft healed and the patient left the hospital wearing a protective leather boot reinforced with steel bars. Nine months following her operation, the patient returned complaining of swelling of the upper part of the leg. A soft elastic tumor was evident. Amputation was performed on April 6, 1938, and pathologic examination pronounced the lesion as myxochondrosarcoma. The patient is alive, without evidence of recurrence or metastases fourteen years following her first operation. For ten years she was checked for metastases at frequent intervals, all examinations having been negative.

Case 14.—G. de T., a white woman, age 33 (History 12673) was first seen at my office on October 6, 1950. She complained of pain on the lateral aspect of the upper third of the right leg of ten months duration. There was no history of trauma. There were no generalized symptoms, such as fever or weight loss. The pain was not acute, and increased with use of the limb. She had been treated with heat applications and antirheumatic drugs. Her general physical condition was splendid. There was slight localized swelling of the upper end of the right fibula, with prominence of the soft parts and increased local temperature. There were no abnormal superficial veins. Motion of the knee was normal. There was very slight pain on palpation. Pain was noted in the popliteal space when investigating Lassegue's sign. X-rays showed a lesion of the upper third of the fibula, with the typical appearance of an osteogenic sarcoma. Though the x-ray picture did not show clear limits to the tumor, it was decided to avoid a mutilating operation, which would have been catastrophic for the morale of this young lady, and to attempt to preserve function in the limb. Accordingly, a block resection was performed on October 14, 1950. Careful dissection of the peroneal nerve was carried out, and resection was done down to normal bone. The only difficulty experienced was at the tibio-fibular joint, where extension into the soft tissues had taken place. After thirty-six hours, deep x-ray therapy was administered. Two years and one day after the operation there was no local recurrence. Use of the limb was normal. Weight gain required diet for its control. A routine x-ray examination of the leg and lungs showed no local recurrence, but a small round, dense nodule was seen in the lower lobe of the left lung. Pulmonary metastasis was suspected. Pneumonectomy was done. The pathologic report was metastatic osteogenic sarcoma.

Case 15.—J. C., a white man, age 19, was seen for the first time at my office on January 19, 1951. Nine months previously he twisted his right leg playing baseball, noticing pain in the anterolateral muscle mass of the leg. Two months later he noticed pain at the same level when walking or running, and slow increase in volume of the region. Three days previously,

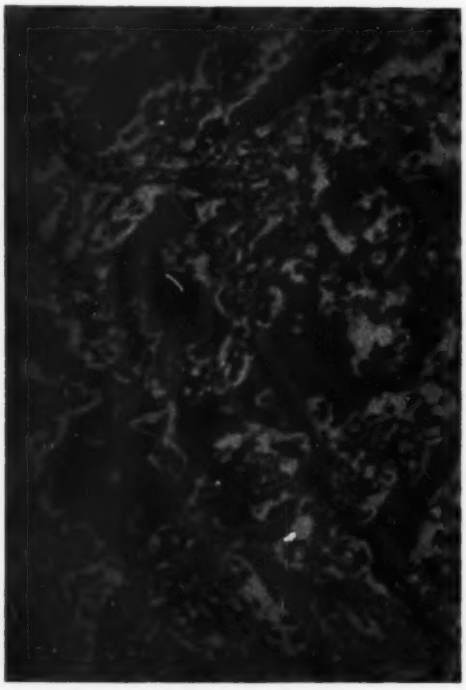


FIG. 7, CASE 14

Microphotograph of histologic section of tumor: osteogenic sarcoma (Leon).

FIG. 8, CASE 14

Histologic aspect of pulmonary metastasis (Leon).

playing ball, he noticed acute pain, swelling, and slight fever. He was treated with rest, cold compresses, ointments, and sedatives. He showed surprisingly good general physical condition, with excellent muscular development. The anterolateral aspect of the leg appeared increased in size, and a hard tumor mass could be palpated, corresponding to the middle third of the fibula. There was increase in local temperature. No superficial venous network was observed. The roentgenograms showed an osteolytic bone lesion having characteristics of malignancy. In this case we advised a block resection, but a frozen section diagnosis of Ewing's endothelioma changed our original plans, and resection was delayed until a course of deep x-ray therapy had been administered. On February 22, 1951 a block resection of practically the entire fibula was carried out. At a last examination on October 15, 1952 there was no evidence of recurrence or metastases. The patient has been working and carrying on a normal life. There is no pain or discomfort in the ankle, even though we did not fuse the malleolar fragment to the tibia, as Coley and Higinbotham have done in some of their cases of segmental resection of the fibula.

Case 16.—N. D. F., a white girl, age 15½, was first seen on March 3, 1947. Two years previously she had injured the second toe of her right foot. There was swelling and pain. She was seen by a physician who diagnosed a double fracture of the proximal phalanx, but no treatment was carried out. The toe had been gradually increasing in volume, and had remained constantly painful. Upon examination a hard tumor mass was found invading the first phalanx of the second toe, which appeared enlarged to about four times its normal diameter. There was slight local heat. There was no enlargement of the inguinal glands. The roentgenograms showed a tumor of the phalanx, expansive in type, with some local signs of malignancy. On March 15, 1947, a complete resection of the first phalanx was done, and a bone graft was implanted in the base of the second phalanx and denuded head of the metatarsal. Healing was obtained and the graft united. The pathologic report was chondrosarcoma. In October 1947 an x-ray showed a fracture of the graft near the metatarsal head, which went on to pseudoarthrosis. However, the patient was symptomless and remained well until March 28, 1950, when a routine x-ray check-up showed an expansive tumor of the distal part of the graft, apparently benign. An amputation of the toe and distal portion of the metatarsal bone was done on April 4, 1950. Dr. Leon reported a

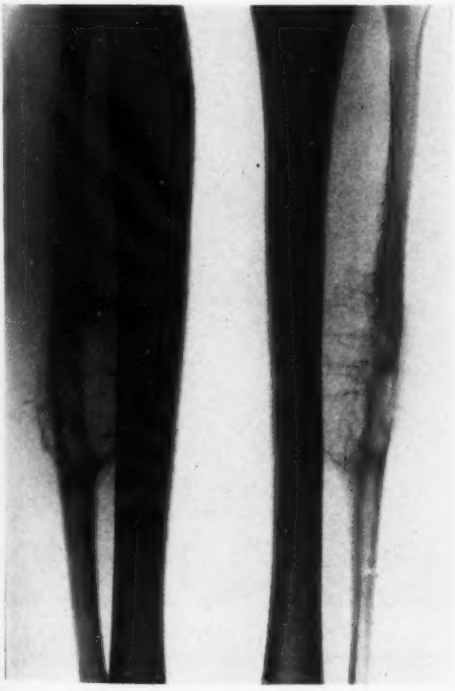


FIG. 9, CASE 15

Radiographic aspect of Ewing's tumor of right fibula.

FIG. 10, CASE 15

Split specimen of bone tumor after resection.

giant-cell tumor on histologic examination. At follow-up examination on October 20, 1952 there is no evidence of recurrence or metastases. In this case the first pathologic report was malignant tumor, while the recurrent lesion showed no malignancy. The case must be considered as that of a borderline tumor, or one with a low grade of malignancy.

Case 17.—E. A., a white man, age 27, was first seen in consultation with Dr. Perez Lorie on November 16, 1949. He had pain of eighteen months duration on the lateral and posterior aspect of the right ankle, with slight swelling behind the external malleolus. There was limping due to pain, and limitation of pronation and supination of the foot. Plantar and dorsiflexion are not painful. There is local heat, swelling, and a well localized painful spot on the posterior aspect of the lower third of the fibula. Only the oblique x-rays showed a destructive process involving the cortex of the fibula very close to the tibio-fibular joint. On January 14, 1950 massive block resection of the lower end of the fibula was done. A tumor mass was found which extended into the joint. The pathologist reported Ewing's sarcoma. Deep x-ray therapy was given. On January 19, 1951 he complained of pain on the medial aspect of the ankle joint. A small swelling was palpated just distal and posterior to the medial malleolus. Surgical exploration and biopsy proved a recurrence of the malignant tumor. The pathologic report in this case was more suggestive of Ewing's tumor. Amputation was then done. The patient is now living in Spain, and when last heard from, was free of metastases.

CONCLUSIONS

Primary block resection of bone tumors has definite indications as surgical treatment in properly selected cases of benign, borderline and malignant bone tumors.

Osteoplastic repair with autogenous massive bone grafts has been done in most of the cases reported. The use of plastic and metallic internal prostheses will make possible a greater use of segmental resection rather than radical mutilating procedures.

In a small number of malignant bone tumors in which it was possible to do a primary massive resection, a longer postoperative survival period was observed, even when a late recurrence has made a secondary amputation imperative.

The necessity for an earlier diagnosis of bone malignancy is emphasized.

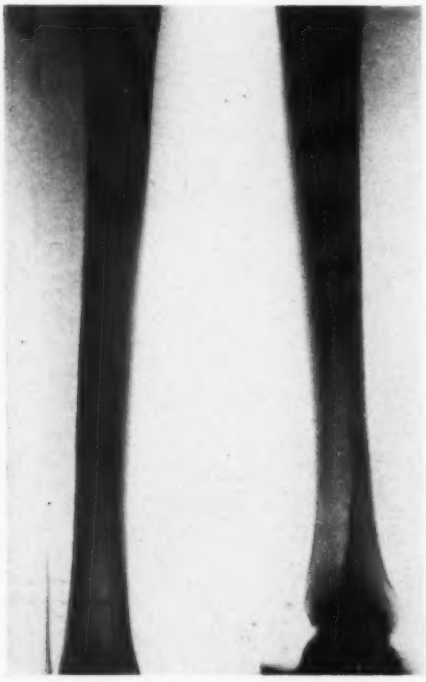


FIG. 11, CASE 15

Radiographic aspect one year after resection. No recurrence.

FIG. 12, CASE 15

Microscopic aspect of tumor. Ewing's tumor (Leon).

AMPUTATIONS OF THE UPPER EXTREMITY WITH PRESENT CONCEPTS OF PROSTHETIC REPLACEMENT*

By JOSEPH W. BATCH, M.D.†
and
AUGUST W. SPITTLER, M.D.‡
Washington, District of Columbia

During the past five years 272 major amputations through the upper extremity were treated and fitted at Walter Reed Army Hospital. This group included 8 shoulder disarticulations, 119 above-elbow amputations, 4 elbow disarticulations, 128 below-elbow amputations, 8 wrist disarticulations, and 5 transcarpal amputations.

In addition, there were 192 patients with 381 amputated fingers.

The major causes for admission were trauma, malignant tumors, and congenital deformities. The majority of the patients admitted for trauma had been treated by an open amputation prior to admission.

Every surgeon who amputates an extremity or treats an amputee should have a thorough understanding of the functions to be replaced by a prosthesis and the means of accomplishing it. Only the crude functions of pinch, grasp, and hook can be replaced by a terminal device; however, the prosthetic arm can more nearly approximate the normal arm in its function of transporting the hand. The wrist and shoulder joints can be fixed without too much loss of function. However, elbow movement is essential if much benefit is to be derived from a terminal device. All concepts of prosthetic replacements should be based on providing a terminal device with control and an elbow joint which can be flexed and locked in a desirable position.

SURGICAL PRINCIPLES

GENERAL

Amputations in the upper extremity may be open or closed. Open amputations are performed at the lowest safe level, and after a period of healing are followed by revision or reamputation.[1] The suture line is better tolerated on the end of the stump than on the lateral surfaces, since the bucket of a prosthesis exerts pressure on the lateral surface and little or no pressure is thrown on the end of the stump.[2,3,4,5] In amputations at all levels in the upper extremity one should plan for a stump with a thin terminal non-adherent scar, a smooth well rounded end, and good fixation of the distal end of the muscles to the bone. In open amputations the traction plus skin revision produces this result. In closed amputations the end of the bone is covered with a thin myofascial layer, a subcutaneous tissue layer and skin.

In general, there should be no so-called ideal site of election for an amputation in the upper extremity. All of the extremity which is functional should be retained, since the higher the level of amputation the greater becomes the disability. An elective amputation in the upper extremity is, therefore, performed at the lowest possible level to eradicate the cause for amputation.

SITES OF AMPUTATION

Since it is impossible and impractical to provide all the functions of the hand by an artificial replacement, the greatest conservation of tissue is necessary in all amputations through the digits and metacarpal area. Often what initially appears to be a useless hand, with time and treatment will become a functional member. A two-digit hand with sensation and pinch is functionally more satisfactory than any known artificial terminal device. Even a single functional digit, particularly a thumb with sensation, can be made more serviceable than a complete artificial replacement.

The carpus and the distal end of the forearm have often been sacrificed because it was believed that the circulation of the long stumps was inadequate, and that the ends of the stumps were too tendinous and bulbous to fit with a prosthesis. These tenets are not considered valid. The surgeon should not sacrifice this length to fit a conventional prosthesis. When the circulation is otherwise adequate and there is a functional range of motion in the wrist, the carpus should be retained, because this flexion, extension, pro-

*Read in Section on Orthopedic and Traumatic Surgery, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

*From the Orthopedic Section, Walter Reed Army Hospital, Washington, D. C.
†Colonel, Medical Corps, U. S. Army.
‡Colonel, Medical Corps, U. S. Army.

nation, and supination is of value to the patient and can be fitted functionally.

Wrist disarticulation amputations allow better pronation and supination than any amputation at a higher level if the radio-ulnar articulation is not disturbed. We do not remove the styloid processes. If there is limitation of motion at the distal radio-ulnar articulation, amputation proximal to this joint may be necessary to produce some pronation and supination. Pronation and supination decrease with the height of the amputation through the forearm.

Short below-elbow stumps, although not capable of actively flexing and extending the forearm sections of the prosthesis with a work load, do assist in these functions and should be retained. They provide lateral stability, prevent rotation, and give better control of the prosthesis. Even when not wearing a prosthesis, such functions as resting the elbow on a chair or bed, pushing through a crowd, or carrying an article under the arm, are appreciated by the amputee.

Elbow disarticulations provide some of the advantages of the short below-elbow stumps. The distal end of the humerus should not be needlessly sacrificed to make the prosthetic fitting easier. The longer the above-elbow stump, the better is the control of the prosthesis. Even short above-elbow stumps should not be sacrificed, as some of them will allow shoulder movement in the replacement or at least help support the shoulder cap.

A bone graft may be performed to lengthen the stump in the arm or forearm when the soft parts and skin flaps are adequate. Skin grafts may be used to fill in defects in non-pressure areas to retain an otherwise good stump in the upper extremity. Large areas of split-thickness or full-thickness grafts are not warranted since they do not sustain the pressure of prosthetic wear.

Shoulder disarticulations should have a well rounded muscular flap if possible.

Scapulo-humeral amputations are usually performed for problems of such a nature that the retention of any parts for prosthetic replacement should not be considered.

PROSTHETIC REPLACEMENT

In the hand with a single digit, a fixed post is fitted over the hand or remaining digital stumps to provide opposition for pinch.

The cosmetic glove offers many variations for filling out a partial hand amputation.

When all fingers and metacarpals are lost it becomes necessary to replace them by mechanical device, either with a hook or a prosthetic hand. The hook is used primarily for function and hard work whereas the hand combines some function with a good cosmetic effect.

We are now fitting all of our amputees with the positive closing and spring opening hook and hand developed at the Army Prosthetic Research Laboratory.

The hook consists of two hook-like fingers attached to an aluminum alloy case containing the working mechanism which allows the fingers to be closed with progressive and controlled tension and locks automatically in any position. A lever on the ulna side of the case, to which is attached the hook control cable, operates the mechanism. There is a small three-position regulator on the case allowing the fingers to open 1-¼ inches; 3-¼ inches; or to operate freely.

The artificial hand consists of a magnesium shell with five fingers attached. The thumb and next two fingers are operated by a mechanism similar to the one in the artificial hook. The other two fingers are non-functioning.

To close and lock on an object, a pull is made on the cable until the fingers of the hook or hand grasp the object securely. Relaxing the pull automatically locks the fingers about the object and tension need not be sustained except in the free wheeling position. To release the grasp, an additional tension is again exerted through the control cable which releases the locking mechanism and the fingers open automatically by spring action.

In carpal amputations the terminal device case is modified to allow space for the stump socket. This allows flexion and extension of the wrist. The socket and forearm cuff are molded of laminated plastic connected by small external wrist hinges. The prosthesis is suspended by flexible elbow hinges to an arm cuff which is attached by a "Y" strap to a suspension and control harness. This harness consists of a simple figure-of-eight nylon

web strap which encircles the opposite shoulder, crosses behind the neck, and continues over the scapula to a connection with the control cable. The control cable is made of steel encased in a flexible housing which is attached by reactor points on the arm and forearm cuffs. A shrug of the opposite shoulder or depression of the same shoulder puts tension on the control cable which operates the terminal device.[3 4 5]

In wrist disarticulations and long forearm amputations, the terminal device is firmly attached to the socket which is short, well molded, and slightly flattened to retain pronation and supination. It is suspended and controlled in the same way as the prosthesis described above.

The medium length below-elbow amputation is fitted with a similar prosthesis except that a multiple position disconnect is added between the terminal device and the socket. This provides for use of the terminal device in various planes and permits rapid interchange of the hook and hand.

In short below-elbow amputations, the prosthesis requires external elbow joints between the forearm socket and the arm cuff to provide stability. These external joints may be free or provided with a locking mechanism. If there is some limitation of motion, the forearm socket, as well as an artificial forearm section, may be connected to the pivot pins of the external elbow hinge and the artificial forearm provided with a mechanical lift. The short stump in its socket moves freely within its range of motion and assists flexion of the forearm section. The harness is similar to that on other below-elbow amputation prostheses, modified so that the control cable which activates the terminal device is so fixed on the forearm section that when the elbow is unlocked tension exerted on the control cable flexes the artificial forearm section, but when the elbow is locked the same tension operates the terminal device. The elbow lock is placed on the medial elbow hinge and is operated by a control cord attached above anteriorly to the suspension harness in such a way that hyperextension or abduction of the shoulder produces tension on the cord.

The elbow disarticulation is fitted with external hinges between the arm socket and forearm section and is operated in much the same way as the short below-elbow amputation.

In above elbow prostheses *(Fig. 1)* a mechanical turntable and elbow joint are added between the arm socket and the forearm section. The elbow may be flexed by a control cable attached to a polycentric lever on the forearm section by flexion of the same shoulder or forward shrug of the opposite shoulder. The locking mechanism of the elbow joint has a trip lever to which is attached a control cord from the anterior strap of the suspension harness. Tension placed on this control cord, by hyperextending the arm stump, locks and unlocks the elbow joint.[1 3 4 5] This elbow joint can be modified to lock automatically in any position upon the sudden release of the forearm flexion by coupling the elbow lock control to the elbow flexion cable. It is unlocked by a repetition of flexion of the forearm section. Smooth flexion and extension of the forearm section results in free wheeling of

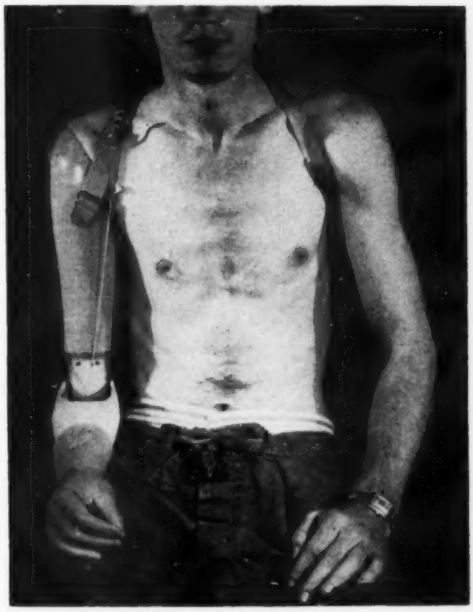


FIG. 1

Anterior view of conventional type prosthesis on a long above elbow amputation stump with APRL hand and cosmetic glove.

the elbow joints. The turntable between the mechanical elbow joint and the arm socket maintains its position by friction and is manually operated. It allows activity in various planes of internal and external rotation. With modifications for stability, the suspension and control harness and cable is similar to that used for the short below-elbow prosthesis *(Fig. 2)*.

A leather or plastic shoulder saddle, held in position by a chest strap, is added to the harnessing in the fitting of the short above-elbow prosthesis. The prosthesis is suspended from the shoulder saddle by flexible hinges. Flexion of the forearm section is controlled by a cable from the posterior aspect of the shoulder saddle to a polycentric lever on the forearm section. This cable is stabilized by reactor points on the arm socket. The terminal device control cable is attached posteriorly to a loop encircling the opposite shoulder. The control cord to the elbow lock is attached anteriorly to the shoulder saddle.

In the shoulder disarticulation, the arm section is fused to a stable shoulder cap. The prosthesis is held to the body by a chest strap which has an elastic segment in its posterior attachment. A cable to the chest strap posteriorly provides flexion of the forearm section. The elbow lock is controlled automatically by a cord to a waist band, or manually. The terminal device control cable is attached posteriorly to a separate loop encircling the opposite shoulder.

The scapulo-humeral amputation can be fitted in a manner similar to the shoulder disarticulation except that controls of the elbow joint are completely manual. For this reason most of the amputees are fitted with only a cosmetic shoulder pad.

The bilateral amputee is fitted with the prosthesis indicated for the level of amputation. The suspension and control harness in general employs the figure-of-eight principle. Both prostheses are suspended from a single harness. Control of the individual prosthesis is similar to that of the unilateral amputee. Coordinated control, however, can often be accomplished for both terminal devices and one or both elbow joints by the movement that would ordinarily activate one prosthesis in a unilateral amputee.

FIG. 2

Posterior view of harnessing conventional type of prosthesis on a long above-elbow amputation stump.

FIG. 3

A transcarpal amputation hooked up to a cinetized biceps muscle illustrating modified APRL hand for stump socket, cosmetic glove, short forearm cuff, wrist hinges and condylar cuff.

CINEPLASTIC REHABILITATION

In order to gain better control of the artificial hook or hand and to improve the efficiency of a prosthesis, the terminal device control cable is attached to a cinetized muscle. Often amputees fitted in this manner gain some positional and tactile sense through their muscle tunnel. In the below-elbow amputees this allows for deletion of much of the harness, and in above-elbow amputees it simplifies it. The components of the prosthesis and terminal device are not changed.

The muscles found most suitable for this procedure are the biceps for the below-elbow and long above-elbow amputees, and the pectoralis major muscle for the short above-elbow amputees and the shoulder disarticulations.

At Walter Reed Army Hospital, 107 cineplastic procedures have been performed on 102 patients. Seventy-eight biceps muscles, of which 17 were in above-elbow amputees and 61 were in below-elbow amputees, 26 pectoral, 2 triceps, and 1 latissimus dorsi muscles have been cinetized. During the past two years approximately two-thirds of all arm amputees have received cineplastic tunnels.

The method of cinetization has been previously described by Kessler, Alldredge, Spittler and others.[6 7 8 9 10] This consists essentially of fashioning a tube from the skin overlying the muscle, passing this through the muscle, and covering the defect with split-thickness skin graft.

The effectiveness of this procedure has been enhanced by definitely freeing the muscle, producing a larger tunnel which has been more favorably positioned for efficiency in fitting, and covering a larger area with a skin graft.

The cinetized biceps muscle is fitted with an acrylic pin of an ox-bow shape. The pectoral tunnel is fitted with a pin in the shape of a question mark.

The control cable from the terminal device is attached to the biceps tunnel pin through a disconnect and equalizer on the forearm section through which a cable is attached to

FIG. 4

Prosthetic fitting on a medium below-elbow amputation stump connected to a biceps cineplasty illustrating the wrist disconnect and the APRL hook.

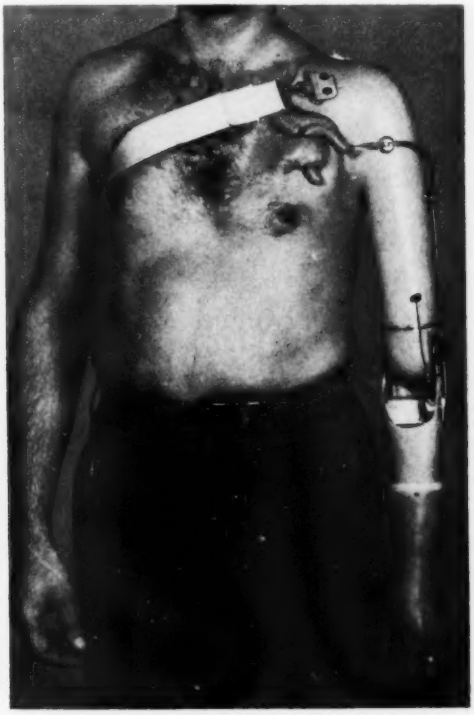


FIG. 5

A prosthesis on a short above-elbow amputation stump hooked to a pectoral cineplasty.

each end of the tunnel pin by ball and socket detachable joints.

In below-elbow amputees, except those with very short stumps, all suspensions and control harness are eliminated except for a small condylar cuff which holds two reactor points to provide equal tension on the control cable throughout the range of elbow flexion *(Figs. 3 and 4)*.

In the short below-elbow and above-elbow amputees these reactor points are placed on the elbow hinge. The arm cuff or socket is modified to allow excursion of the biceps muscle tunnel in its pull on the terminal device control cable, and the suspension harness is simplified to support the prosthesis and control the elbow joint.

In the short above-elbow amputation, the terminal device control cable is attached to the pectoralis tunnel pin with reactor points on the prosthesis and shoulder saddle to allow shoulder motion without variation in cable length and to prevent torque transmission into the arm socket. The shoulder saddle is modified to permit tunnel movement.

FIG. 6

Bilateral Krukenberg amputation in a blind patient.

In amputees requiring a fixed shoulder cap, the reactor points are located in the most direct line of pull *(Fig. 5)*.

KRUKENBERG REHABILITATION

In a blind bilateral forearm amputee, the Krukenberg method of phalangizing the radius and ulna provides the best method for rehabilitation *(Fig. 6)*. It provides prehension and pinch with tactile sense. No prosthesis is necessary, but handles of tools and utensils may be modified for ease of handling. Although only one of these patients has been treated at Walter Reed Army Hospital during this period, his rehabilitation is progressing well enough to advocate this method for other similar cases.

BIBLIOGRAPHY

1. Kirk, Norman T.: Amputations. Vol. 3, Chap. 10. Hagerstown, Md.: W. F. Prior Company, 1942.
2. Thompson, Vernon P.: The Amputation Stump from the Prosthetic Point of View. J.A.M.A., **124**:1036 (April 8) 1944.
3. Carnes, E. H.: Amputations, Stumps and Prosthesis. War Medicine, **1**:656 (Sept.) 1941.
4. Craft, A. W. J.: Surgical Amputations and the Fitting of Artificial Limbs. Brit. Med. J., **2**:389 (Oct. 3) 1942.
5. Verrall, P. Jenner: Amputation Stumps and Artificial Limbs. Brit. Med. J., **1**:62 (Jan. 13) 1940.
6. Alldredge, Rufus H.: General Principles of Amputations and Artificial Limbs in the Upper Extremity. Chap. 15, No. 1. The Academy of Orthopaedic Surgeons Instructional Course Lectures, Vol. 8, 1951.
7. Kessler, Henry H.: Amputation and Prosthesis. Amer. J. Surg., **43**:560 (Feb.) 1939.
8. Slocum, Donald B.: Amputations of the Hand and Forearm. Chap. 15, No. 2. The Academy of Orthopaedic Surgeons Instructional Course Lectures, Vol. 8, 1951.
9. Spittler, August W.; and Rosen, Irwin E.: Cineplastic Muscle Motors for Prostheses of Arm Amputees. J. Bone and Joint Surg., **33**-A:601-611 (July) 1951.
10. Thomas, Atha: Amputations of the Upper Extremity Above the Elbow, Surgical and Prosthetic Considerations. Chap. 15, No. 3. The Am. Academy of Orthopaedic Surgeons Instructional Course, Vol. 8, 1951.

DISCUSSION *(Abstract)*

Dr. Arthur H. Weiland, Coral Gables, Fla.—A very important point which the authors have driven home is that there is no site of predilection for an amputation in the upper extremity, and that by all means all tissue possible must be saved. We are indeed fortunate that we have an institution such as the amputation center at Walter Reed, and men of this caliber who will take the time to study the intricacies of the application of the prosthesis which has been demonstrated for us by the authors.

Dr. T. Campbell Thompson, New York, N. Y.—A tremendous amount of work is done in fitting even one of these individuals. It takes a great deal of time and a great deal of cooperation, and it is not easy to do. It has to be really done in a place where you have the complete cooperation of the patient, surgeon, and limb fitter. I was hoping that Dr. Alldredge would mention the similarity between the application of prostheses and braces, because I think that our brace work is lagging behind more than the artificial limb work, and that we have a great deal that we can

learn in proper fitting of braces from these amputees. We are now in the process of fitting several polio patients (who have come in asking for amputation) with mechanical supports that work on the same principles.

Dr. Milton S. Thompson, San Antonio, Tex.—There is probably no hospital staff in the world, with the possible exception of Queen Mary's in Roehampton, more qualified to speak on this subject than the staff at Walter Reed Army Hospital. At Brooke Army Hospital, we have done, at the present time, about ten cineplasties which is nowhere near the number that have been done at Walter Reed. Before we did our first one, Dr. M. H. Morris of our attending staff went to Walter Reed to see how it was done.

The new articulated hand is an engineering triumph, but the idea is not new. In the armory of Lockloster Castle just north of Stockholm, there is an iron hand with articulated fingers that was made and used in the fourteenth century. Six positions of the first three fingers are obtained by releasing a lock lever on the dorsum of the hand.

Colonel Batch said that in non-pressure-bearing areas, skin grafts were useful. I believe Dr. Alldredge once wrote that skin grafts had no place in amputation surgery. We use split-thickness grafts in avulsed wounds to promote prompter healing and to avoid the induration of chronic infection. They are frequently, but not always, completely removed during plastic revision after healing is complete. I agree with the authors that skin grafts may be useful in a non-pressure-bearing area.

Dr. Alfred R. Shands, Jr., Wilmington, Del.—I have done no cineplastic procedures. Colonel Spittler and Colonel Batch, of the Walter Reed Hospital, are to be congratulated on the splendid results they have obtained in the use of this procedure. Cineplastic operations are not widely done, but it is an operation which certainly has its place in selected cases. It is not a simple operation, and anyone contemplating performing this operation should learn well the technic before proceeding.

THE CONCEPT AND CLINICAL ASPECTS OF FACTITIAL DERMATITIS*

By D. Truett Gandy, M.D.†
Houston, Texas

The role of psychosomatic mechanisms in medicine has received much emphasis in recent years. The incessant wear and tear of modern contemporary life is resulting in increasing numbers of maladjusted persons with psychoneurotic tendencies. Millions are chronically unhappy, disturbed or uneasy, oppressed by a sense of futility and searching for some meaning in their lives. Indeed, some commentators are claiming this phenomenon to be a threat to civilization.[1]

Unsuccessful attempts to find a physical basis for many illnesses have led to the realization that they may arise from the deep, hidden springs of emotional instability. Some skin diseases previously considered to be in the realm of purely physical dermatology are now known to have a psychological as well as a physical component. Every dermatologist sees patients with pathological trends in the personality which seem clearly related to the perpetuation of the skin trouble if not to its cause.

Dermatitis factitia is a psychocutaneous syndrome which is really not a skin disease at all, as ordinarily understood, but rather a projection peripherally upon the skin of a disordered condition of the mind. The exotic nature of the lesions, the personal equation, and the inherent challenge to the physician give to this by-way of dermatology a certain fascination. A brief review of the subject, with a summary of the facts and of the approach to a diagnosis, is the purpose of this communication.

Classification.—The number of published examples of factitial dermatoses now forms a considerable literature. A study of these reports shows that while there is a common denominator in the morphology of the lesions themselves, and a similarity in the devices employed to induce them, the emotional patterns of the individuals who perpetrate these deceptions may run the gamut of the whole field of psychiatry.

Various classifications of the self-inflicted dermatoses have been proposed. Broadly speaking, they may be divided into two definitive categories: namely, those in which the patient admits the fact of self-infliction and those in which he denies it. The first group embraces the acarophobic, the trichotillomanic, the neurotic excoriator and related psychotics and is not germane to this discussion. The term dermatitis factitia is reserved by most writers for the second group which includes two classes of cases: first, the hysteric,

*Chairman's Address, Section on Dermatology and Syphilology, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

†Associate Clinical Professor of Dermatology and Syphilology, Baylor University College of Medicine, Houston, Texas.

who injures his skin with or without a conscious desire to do so, and second, the malingerer, who practices his fraud with the deliberate intention of gaining some end.

We come now to a pertinent question. Just what is the relationship between malingering and hysteria? It is evident that the counterfeit lesions of the malingerer are provoked by the patient with intent to deceive, using the word intent in the ordinary sense of a conscious act of the will. The hysteric, on the other hand, manufactures his lesions to satisfy some peculiar inner need rather than for gross material gain. Since other hysterical manifestations are often present it is argued by some that the act is performed while in an hysterical trance, the subject later having no remembrance of his own instrumentality in the production of the lesions. This is disputed by others who point out that the trance would have to recur in the right time sequence, just often enough to keep older lesions active or for crop-like appearances of new ones, and that the patient is fully conscious of what he is doing though he may not know why; he may be malingering but it is unconscious malingering. There is general agreement on one remarkable observation: the mental attitude of calm and complaisance ("the belle indifference" of the French) in the face of scarring and disfigurement which the victim may be inflicting upon himself is at times almost unbelievable.

Motivation.—One could hardly enumerate all the variants of motive. Environmental friction, economic insecurity, loss of self-esteem, expiation of guilt, attainment of revenge, the dodging of responsibility and numerous other motive forces appear in the case histories of the existing literature. The possibilities are as varied as are the personalities and life situations of the patients themselves. They may range all the way from a simple desire to excite the commiseration of family or friends to an attempt at rationalization for feelings of frustration or failure in life. The hysterical type of personality may give up the competitive struggle and seek to save face by simulating a physical illness. A motive which seems ample or sufficient to the patient may be meaningless or absurd to the physician.

The pure malingerer is an imposter. He does not indulge in self-reproach. In his studied artifice he trades on his feigned eruption. He may hope for insurance benefit or to obtain release from unpleasant duties or surroundings. He has a definite and understandable objective. His acts may be immoral but at least they are sane. At the other extreme, in the hysterical group, are many patients who are approaching the borderline of insanity. The search for a motive must always be made as a means of confirming the diagnosis.

Clinical Features.—The idea of self-mutilation may be suggested to the patient in various ways. Self-induced exaggeration of an existing lesion may be cunningly contrived, and this applies in particular to occupational dermatitis, or a bona fide skin disease may furnish lesions to be copied. Many types of eruptions have been described, the technic of their production being apt and suitable to the end in view and limited only by the ingenuity of the patient. They include eczematous dermatitis caused by vigorous friction with sandpaper, ecchymotic patches or suggillation induced by pressure or suction, and burning of the skin with heated objects. Mechanical traumatization with sharp pointed implements such as needles and knives is resorted to at times. But the majority of factitial lesions are chemical burns, produced by phenol, lysol, acids, alkalies, and a variety of other corrosives. In Ormsby's[2] series of thirty-four patients 40 per cent used phenol. All gradations of inflammatory and destructive effects upon the skin and subcutaneous tissues are seen, from simple erythema to necrosis and gangrene. The disorder may masquerade for a time as a legitimate skin disease and undergo a variety of treatments. Pyogenic infection is often superimposed to further confuse the picture.

Factitial lesions have about them an indefinable something which arouses suspicion. They do not satisfy the expected conditions of genuine disease, bearing no real resemblance to any recognized dermatosis. Here intuition holds a unique place among diagnostic criteria. The experienced observer may have a hunch on first glance at the lesions. They have too much pattern or precision. They look phony.

When the patient indulges his fancy in creating odd shapes and outlines such as spirals or cartwheels, or geometric configurations such as straight lines or square borders no real difficulties in diagnosis are presented. But there are many puzzling cases which require

penetrating analysis and indeed some of them are never solved.

Among the guiding clinical earmarks are the following:

The lesions are not preceded by any local changes and they run a fairly rapid course. They tend to be angular rather than rounded. They are usually sharply marginate in contradistinction to the gradual fading seen in natural disease. The surrounding terrain is normal; that is, the skin is free from any abnormalities up to the very edge of the lesion. An advancing border may show numerous individual punctures due to application of the cauterant with a needle or pin. The commonest type is the gangrenous ulcer with a characteristic black eschar. Evidence of the destructiveness of the process is seen in scar formation, varying from thin, atrophic types to keloidal changes. The gangrene of factitial lesions is superficial and demarcated from the sound skin by a narrow zone of erythema. It is important to distinguish between gangrene of the skin, which follows external injury, and gangrene of a part. Stokes and Garner[3] state that "gangrene is so unusual an intrinsic lesion of the skin as such that, in and of itself, wherever it occurs, it raises the question of self-infliction." Discoloration at the borders of a lesion or staining of the fingers or nails or clothing may throw some light on the agent employed. Benedek[4] points out that acids change the color and the cuticle of the hair and that examination of the hairs in and around the eruption may furnish a clue to the chemical used. Varney[5] suggests that litmus paper may show an acid reaction in the serum of a suspected lesion. When caustic fluid is used clumsy manipulation sometimes allows a drop or two to dribble down the skin, leaving a comet-like tail or streak-shaped subsidiary lesion, which is lighter in color and less inflammatory than the parent lesion to which it is joined. This little circumstance escapes the patient but certifies to the perceptive examiner the hand-made article.

The distribution of the lesions may be totally unsymmetrical or fantastically symmetrical. Their location is important. Accessibility to the patient's hands has diagnostic weight. They are usually confined to one side of the body, the left side if the patient is right-handed and vice versa. While no region of the body is immune, the exhibitionist may place them conspicuously on the front of the face or abdomen, though the arm, forearm and hand are more favored sites, and the tendency to spare sensitive areas like the eyelids, mouth, nipple and genitalia is noteworthy.

For obvious reasons the lesions make their appearance suddenly and when the patient is alone. They have a habit of appearing, multiplying, or relapsing during the course of a night. A favorite stunt is to predict accurately the location in which a new eruption will develop, to the great mystification of the patient's attendants. Recurrent outbreaks may coincide with a return to work, with emotional stress, or with the expected or actual visits of a particular person,[3] or they may follow disappearance from observation.

Careful interrogation should be conducted. The patient may be a good actor, but the history does not ring true. Repeated cross-examination may involve him in contradic-

FIG. 1

Factitial lesions produced by application of phenol, showing gangrenous eschars, surrounded by narrow zone of erythema, artificial grouping, and a linear streak depending from one lesion where a drop of the caustic fluid has run down the skin.

tions. Once a presumption of self-infliction has been raised an appraisal of the patient's make-up and manner is a valuable though not infallible aid. Evasiveness and veiled antagonism; a semi-artful expression of innocence; a sullen demeanor with furtive and hangdog look; or a frankness so engaging as to be disarming: any of these poses may lead to betrayal. In certain instances, as I have already mentioned, a peculiarly unemotional, poker-faced indifference displayed by the patient toward his disease is so unnatural as to be striking. Yet it must be remembered that a skilled dissembler can avoid all of these appearances.

CASE HISTORIES

Brief discussion of a few cases will serve to exemplify some of the foregoing fundamentals.

Perhaps the simplest type of case is the one in which the patient seeks to escape a situation which he does not care to face, as illustrated by the schoolgirl, aged 15, whose trouble began with a small lesion, presumed to be an infection, on the dorsum of the left hand. At intervals during the following three weeks new lesions made their appearance above successive dressings and the bandaging marched slowly up the arm. The mother finally insisted on calling in another doctor who was as puzzled as the first.

The patient was seen in consultation in the home. Before the bandages had been completely removed it was evident that the eruption was self-produced, and it was evident also that the patient was enjoying the drama of the situation. The lesions were ulcerative and necrotic, in various stages of healing, sharply outlined, bizarre in shape, and obviously due to some caustic application.

The mother was shocked at the diagnosis and was not fully convinced until concentrated lye was found concealed in her daughter's room. A confession was promptly obtained. Until her secret was discovered the patient had been quite successful in her efforts to avoid school.

Utilizing factitial lesions as an attention-getting device is typified by the case of Mrs. D.C.M., aged 36, who enjoyed good physical health but was emotionally unstable. She was two years older than her husband and her eleven-year marriage had been childless. She and her husband were both active in the social whirl.

She was referred for advice concerning a "poison ivy" eruption which had exacerbated several times during its three weeks course. At the time of examination she presented relics of healed lesions on the left arm and shoulder and an acute eruption on the left breast, but not involving the nipple. The patient was right handed. The lesions on the breast were superficial erosions and bullae arising from normal skin. The artificial pattern, uniformity and abnormal grouping aroused suspicion of a factitial origin.

But the patient indignantly denied self-infliction and left the office in a huff. Nevertheless, a provisional diagnosis of dermatitis factitia was offered to her family physician. Later she confessed to him and recovered. An accidental lysol burn had suggested to her the idea and provided the agent for carrying it out. It seems that she had fancied her husband in love with another woman and had taken this means of soliciting his attention and sympathy.

Submission to surgical mutilation is by no means unique, and the literature is replete with examples. I will cite two.

An unmarried woman, aged 31,[6] achieved so successful a deception in producing artificial gangrene, intermittently maintained over a period of nine years, as to necessitate a total of thirty-three successive operations in a piece-meal amputation of the left upper extremity, culminating in its complete removal up to the glenoid fossa of the scapula.

A girl, aged 18,[2] an undergraduate nurse, infected her finger while dressing a patient. The lesion promptly healed, but a few weeks later the tip of the finger developed an inflammatory process, which subsided under wet dressings. During the next six months this happened several times, and the first phalanx was finally amputated for gangrene. Eight weeks later the second phalanx of the same finger suffered the same fate. Twelve weeks later the third phalanx went the way of the other two. There was no further trouble for several months. Then suddenly gangrene began to spread over the dorsum of the hand. The surgeon became thoroughly alarmed, and the patient tearfully implored him to amputate her hand and save her life. But he decided to have consultation first.

On inspection the gangrene was observed to be very superficial, with a narrow, red line at the margin, and in the irregular, advancing border, multiple, fine punctures could be discerned. Anesthetic areas of the fauces and conjunctiva were demonstrated in this patient. She refused to admit self-infliction, but recovered under fixed dressings, and later acknowledged to her superiors that she had provoked the trouble herself with a needle dipped in phenol.

COMMENT

This subject has always been an intriguing one to me. While traveling abroad in the summer of 1950 I made inquiry concerning it among dermatologic colleagues and was told, both in the British Isles and on the Continent, that the incidence of factitial dermatoses is doubtless higher than in America, and that the economic stress of the war and postwar years among the poorer classes of Europe has produced a large number of professional malingerers.

While the diagnosis of factitial lesions may be comparatively easy the securing of proof may be extremely difficult. There is perhaps no dermatosis in which it is more important to weigh all the facts before arriving at a

conclusion or expressing an opinion, for no mistake in diagnosis is more resented, so the point need not be labored that the examiner should be sure of his ground before making any open impeachment. The natural impulse is to confront the patient at once with the charge. But this may not lead to happy results if it is met only by indignant repudiation on the part of the patient and incredulity on the part of the relatives. Even the family physician, through long personal acquaintance, may be prejudiced in the patient's favor. But it is to be emphasized that wealth, social station, intelligence or character have no validity whatever as arguments against the possibility of self-infliction.

When confrontation is considered inadvisable, or the diagnosis is in doubt, observational control is called for, in the home if the confidence and cooperation of the family can be obtained, or in the hospital where occlusive dressings can best be used and the course of developments watched.

The most important facet of this problem is its psychodynamics. The emotional life of the individual holds the key to the solution. The patient with dermatitis factitia, whether hysteric or malingerer, usually does not desire psychologic insight and hence psychotherapy may be of limited value. Yet a better understanding of this entity surely lies in the direction of psychiatric data obtained through careful and detailed case studies. It is quite probable that the whole question is susceptible of illumination by psychoanalytic methods. Certain it is that in many patients the problem is more one for the psychiatrist than for the dermatologist once the latter has pronounced his diagnosis. One fact seems clear: in this type of patient we must learn how to restore his emotional equilibrium on the inside if we are to relieve his physical eruptions on the skinside.

BIBLIOGRAPHY

1. Klauder, J. V., in discussion on Lynch, F. W.; Hinckley, R. G.; and Cowan, D. W.: Psychosomatic Studies in Dermatology. Arch. Dermat. and Syph., 51:251 (April) 1945.
2. Ormsby, O. S.: Factitious Dermatoses. J.A.M.A., 65:1622 (Nov.) 1915.
3. Stokes, John H.; and Garner, Vaughn C.: The Diagnosis of Self-Inflicted Lesions of the Skin. J.A.M.A., 93:438 (Aug. 10) 1929.
4. Benedek, T.: The Hair as Circumstantial Evidence in a Case of Malingering. J. Invest. Dermat., 9:55 (July) 1947.
5. Varney, H. R.: Dermatological Malingering. J. Michigan Med. Soc., 17:121 (April) 1918.
6. Prosser Thomas, E. W.: Dermatitis Artefacta: A Note on an Unusual Case. Brit. Med. J., 1:804 (April 17) 1937.

THE ADVANTAGES OF X-RAY DIAGNOSIS IN PREGNANCY*

By ROBERT H. BARTER, M.D.
and
JOHN PARKS, M.D.
Washington, District of Columbia

The primary purpose of this paper is to demonstrate specific instances in which the use of diagnostic x-rays have been of invaluable aid to the obstetrician. The secondary purpose is that of substantiating the many previous claims which have shown how x-ray studies may be integrated with clinical judgment. Better care of the patient and of her infant results from the clinical application of x-ray diagnosis.

Even though the use of x-ray diagnosis as applied to obstetrics is becoming more prevalent, relatively few obstetricians utilize its full potentialities.[1] Practical application of this diagnostic adjunct has only recently gained prominence, although the potential value of x-ray diagnosis in obstetrics was recognized over fifty years ago by Munro Kerr.[2] The current x-ray status in obstetrics is similar to that of two or three decades ago when many physicians thought that chest x-rays would never assume a significant place in the diagnosis of thoracic conditions. The practice of obstetrics has always been regarded as an art. By the addition of x-ray diagnosis an undeniable scientific factor has been added to obstetrical practice.[3]

It has been said that the failure of many obstetricians to accept x-ray diagnosis is due to the fact that the subject has been presented in a confusing manner, and in too great profusion.[4] That criticism applies more specifically to x-ray pelvimetry than to any other aspect of x-ray diagnosis. Misunderstanding and failure to comprehend the seeming intricacies of x-ray pelvimetry have contributed to a lack of interest on the part of the obstetrician. Some antagonism has developed between roentgenologists and obstetricians, due to at-

---

*Read in Section on Obstetrics, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

*From the Department of Obstetrics and Gynecology, the George Washington University School of Medicine, Washington, D. C.

tempts by roentgenologists to prognosticate the clinical course of labor. Only when the two specialists work together can x-rays be of real value to the clinician in his care for the maternity patient and her unborn fetus.

I. X-RAY PELVIMETRY

(1) Ideally all primigravid patients at term should have x-ray pelvimetry, in the same manner that a routine chest film is obtained. Only by that approach, will all contracted pelves be discovered. From a practical standpoint, only those patients who have abnormal clinical findings upon manual mensuration are subjected to x-ray pelvimetry. These abnormal findings are:

(a) A diagonal conjugate of 11.5 cm. or less[5] *(Fig. 1)*.

(b) A reduction in the interspinous and intertuberous diameters *(Fig. 2)*.

(c) Abnormal curvature or forward displacement of the sacrum *(Fig. 3)*.

(d) Characteristics of the masculine type of pelvis.

(2) All primigravid patients with a breech or other abnormal presentation should have the benefit of x-ray pelvimetry *(Fig. 4)*.

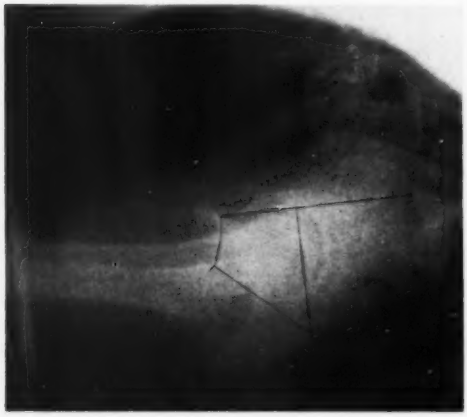


FIG. 1

Diagonal conjugate 11 cm. True conjugate 9.5 cm. Inlet capacity 78 per cent. Midpelvic capacity 89 per cent. Twin pregnancy. Delivered by extraperitoneal cesarean section after adequate trial of labor with ruptured membranes. There was complete failure of engagement (Gallinger Muncipal Hospital).

FIG. 3

This figure demonstrates anterior inclination of the sacrum. Inlet capacity 110 per cent. Midpelvic capacity 82 per cent. Delivered by cesarean section after adequate labor. Baby weighed 7½ lbs. (Parks and Barter).

FIG. 2

Typical transversely contracted pelvis. Interspinous 9.3 cm. (William T. Lady).

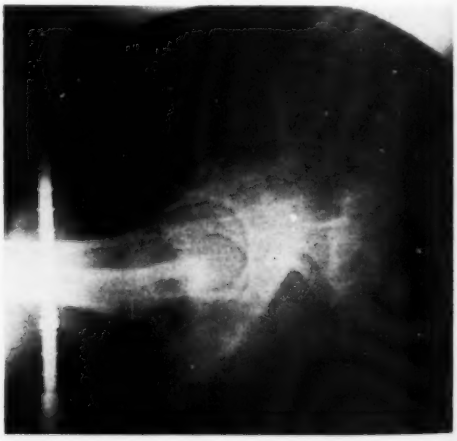


FIG. 4

Breech presentation in presence of marked pelvic contracture. Inlet capacity 59 per cent. Midpelvic capacity 85 per cent. Delivered by cesarean section (Gallinger Municipal Hospital).

(3) Any primigravida with an unengaged fetal head at term should have x-ray pelvimetry.

(4) From the recent work of Baird,[6] all patients five feet or less in height should have pelvic x-rays.

(5) All patients with abnormal presentations should have x-ray pelvimetry, particularly if the fetus is estimated to be larger than any baby which the patient has had previously.

(6) Any patient with a history of difficult labor should have the benefit of x-rays.

(7) Any patient who is to be allowed a trial labor after having had a previous cesarean section, an hysterectomy, or a myomectomy should have x-ray pelvimetry.

(8) Any patient who is progressing poorly in labor should have pelvioradiography.

(9) Any patient with a history of fracture of the bony pelvis should have x-ray pelvimetry.

(10) From a practical standpoint, no patient should be classified as having true uterine inertia unless the "protective inertia" of cephalopelvic disproportion has been eliminated as a cause of the ineffective labor. Likewise, intravenous pitocin® should not be given in the treatment of uterine inertia unless x-rays have shown no contraction of the pelvis.[7]

The method of x-ray mensuration is not of extreme importance, for most methods have been shown to be accurate. However, it is important to use a method such as that of Isaacs,[8] which gives a true view of the pelvic inlet. The morphology of the inlet usually indicates the obstetrical characteristics of the entire pelvis. X-ray pelvimetry has clearly demonstrated that the inlet measurements are of secondary importance to those of the plane of the midpelvis. The midpelvic capacity is practically always less than that of the inlet. The only exception to that rule is the patient who has a rachitic pelvis, where the midpelvic capacity may actually be greater than that at the pelvic brim.

In regard to pelvic capacity the method of Mengert[9] has been found to be quite satisfactory. In that system the actual pelvic capacity is compared to a standard figure and the per cent of capacity above or below normal is obtained. Eighty-five per cent of normal capacity at the plane of the inlet or of the midpelvis represents the critical level for the passage of an average size fetus. An accepted standard for pelvic capacity is better than the older method of individual cephalopelvic "relationships" by means of stereoscopic films. The stereoscopic method is of limited value in the management of breech delivery, the situation in which x-ray pelvimetry has its greatest indication.

All doubt as to pelvic size can be eliminated by means of x-ray pelvimetry. The variables of labor and the size of the fetus are then more easily evaluated. In the presence of a known amount of pelvic contraction, a trial of labor can be conducted with intelligent anticipation. There is no longer any need for a patient to endure a prolonged labor or to be subjected to a "difficult" midforceps delivery due to failure to recognize pelvic contracture.[10]

It has been shown repeatedly that the use of x-ray pelvimetry, when combined with clinical judgment, has not increased the incidence of cesarean section.[11 12] No patient with a vertex presentation, in the absence of an obviously extreme degree of disproportion, should ever be delivered by cesarean section upon x-ray indications alone. No labor should be induced artificially in the presence of any degree of pelvic contraction.[2] Each patient with a borderline pelvis should be allowed a spontaneous onset of labor.[13] After actual labor has produced effacement and partial dilation of the cervix, the membranes should be ruptured. Under these circumstances the obstetrician is better qualified to arrive at a decision regarding the need for delivery by cesarean section.

True inlet contraction in the presence of a normal pelvis is relatively easy to handle. One is able to make a decision fairly early as to whether or not the fetus will descend through the contracted pelvic brim. This condition is more frequently found in patients who have a rachitic type of pelvis.

Accurate knowledge of the pelvic morphology can best be determined by x-ray views of the inlet. The morphology is a valuable factor in prognosis.[3 14 15] The patient whose pelvis is of borderline capacity, does best with a gynecoid configuration. The flat pelvis is next, followed closely by the anthropoid type.

Of all, the most difficult type of borderline pelvis which confronts the obstetrician is the android.

The importance of the midpelvic diameters was stressed in former years by Hanson.[16] Accurate measurement of the plane of the midpelvis, the most important plane of the pelvis, can be done only by x-ray pelvimetry.[17 18] Since the advent of definite midpelvic measurements, two long standing principles of obstetrical practice should be re-evaluated. The first is the older idea that "engagement" of the head signifies that there should be no difficulty in delivery. In the presence of a normal inlet, midpelvic contraction may produce dystocia, even though the head "engaged" clinically prior to labor. Second, recent x-ray studies have shown that the so-called "funnel pelvis" of the earlier literature exists but rarely.[11] With only an occasional exception the plane of the outlet is larger than that of the midpelvis.[19] "Outlet dystocia" practically always is preceded by midpelvic dystocia.[16]

Patients who have a relative degree of midpelvic contraction can usually be allowed an adequate trial of labor. Midpelvic contraction in the gynecoid and anthropoid pelves carries the best prognosis due to a more favorable posterior sagittal diameter. Midpelvic contraction in an android pelvis (and it is most commonly found in that type) has the poorest prognosis due to the characteristically short posterior sagittal diameter.[3 15]

FIG. 5

Rachitic type of pelvis demonstrating the relatively large midpelvis as compared to the inlet. Inlet 67 per cent of normal capacity. Midpelvis 140 per cent. Patient delivered by extraperitoneal cesarean section after short trial of labor. Infant weighed 6 lbs. 4½ oz. (Gallinger Municipal Hospital).

Cardinal points in dealing with midpelvic dystocia concern the use of forceps. Midforceps rotation is often difficult, dangerous and deleterious to the welfare of both mother and fetus. Second, it is better judgment to desist from a traumatic "hard pull" type of midforceps delivery, and resort to cesarean section. That situation should occur very infrequently, however, if x-ray pelvimetry is employed.[10]

The morphology of the sacrum can best be determined by means of x-rays. Poor sacral configuration plays a determining role in whether or not delivery through the vagina can be accomplished safely. The rachitic type of sacrum helps to produce a poor inlet plane, but in general the backward flare of the sacrum in that type of pelvis helps to produce an adequate midpelvis *(Fig. 5)*. Conversely, an anterior encroachment of the terminal sacrum of severe degree, although not commonly encountered, may make vaginal delivery impossible or extremely hazardous.

II. OTHER USES OF DIAGNOSTIC X-RAYS

The primary diagnosis of fetal presence may be established by x-rays. The fetal skeleton usually is visible in a thin individual after the sixteenth to eighteenth week of gestation.[20] After the eighteenth week, the absence of radiopaque fetal parts may be of great help in making the diagnosis of hydatidiform mole or missed abortion.

The determination of presentation and position of the fetus is an extremely valuable use of diagnostic x-rays. It is by far the most accurate means of determining the exact fetomaternal relationship. Verification of a suspected fetal malpresentation is important. In the presence of a contracted pelvis it is imperative that the presentation be definitely known; for vertex and breech presentations, under those circumstances, may have an entirely different prognosis.

The antepartum diagnosis of multiple pregnancy can be made only with certainty by x-ray. The diagnosis may be apparent clinically, but x-rays will confirm or disprove the

clinical impression. Even x-ray evidence may be misleading. Active fetal movement, particularly of the upper twin, may prevent the clinician from seeing one of the fetal shadows. Also failure to include the entire abdomen on the film makes it possible to miss one of the fetuses.

In the presence of an overdistended uterus, an x-ray is important to differentiate between polyhydramnios, a single large fetus, or a multiple gestation. The method of handling the three different entities differs greatly. Therefore an exact diagnosis is vitally necessary.

In the late weeks of pregnancy the age of the fetus may be determined to some degree. After the thirty-fifth week of gestation, the epiphysis of the distal end of the femur becomes visible in a high percentage of patients. The inferior femoral epiphysis will be seen in 95 per cent of fetuses *in utero* at term.[21]

The exact diagnosis of excessive fetal size by x-ray is difficult and probably impossible. This also applies to the diagnosis of postmaturity.

The antepartum diagnosis of an anomalous fetus can be made in most instances. If the uterus is too small or too large for its gestational date, antenatal x-rays may show the presence of a fetal anomaly. The presence of an anencephalic or of a microcephalic fetus may be suspected in the uterus that is abnormally small *(Fig. 6)*. In the presence of polyhydramnios the incidence of fetal anomalies is unusually high.

The diagnosis of hydrocephalus may be made by x-ray. Diagnostic error due to x-ray distortion may occur, particularly if the fetus is presenting as a breech. Breech presentation occurs in about 30 per cent of fetuses with hydrocephalus.[22] Gaping suture lines, marked disparity between the outline of the thin skull and the facial bones, and a globular shape of the head will help to establish a positive diagnosis of hydrocephaly, even when x-ray distortion is present[23] *(Fig. 7)*.

In the presence of acute polydramnios, if the initial film shows no fetal abnormalities, it is a good idea to re-ray the abdomen after the uterus has been decompressed by release of the amniotic fluid. Anomalies may then be seen which might have been undetected due to the presence of the excessive amount of fluid.[24]

Fetal death *in utero* may be established by x-ray, although the findings may not become apparent until several days after the death of the fetus. The most common finding is that of overlapping of the skull bones (Spalding's sign), but bizarre attitudes of the fetal extremities, and a loss of normal concavity of

FIG. 6

Anencephalic fetus (Harry Douglas).

FIG. 7

Hydrocephalus. Note thin bones of the skull and disparity between size of head and size of the facial bones. Vaginal delivery after removal of 600 cc. of fluid from the head (Gallinger Municipal Hospital).

the fetal spinal column may be additional factors upon which to make the diagnosis. The presence of air in the great vessels of the fetus *in utero* has also been described as a sign of fetal death.[25] Severe moulding of the fetal head with overlapping of the skull bones may be mistaken for fetal death *(Fig. 8)*.

Fetal hydrops, most commonly due to erythroblastosis, may occasionally be diagnosed by antepartum x-rays. The diagnosis is made by the Buddha-like attitude of the fetus due to the fact that the upper extremities are pushed upwards and outwards by the distended fetal abdomen.[26] At times there may be a fetal halo due to edema of the scalp.

FIG. 8

Excessive moulding during labor due to transverse contraction of the pelvis. Could be mistaken for fetal death. Uncomplicated midforceps delivery (William T. Lady).

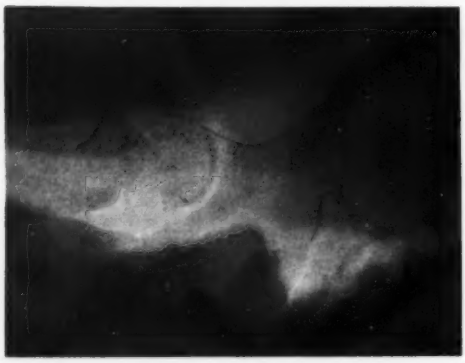


FIG. 9

X-ray demonstration of anterior displacement of fetal head due to posterior placenta previa. Patient had had a previous cesarean section for the same condition 2 years previously. Delivery by elective cesarean section. Diagnosis substantiated at time of operation (Parks and Barter).

Placentography has been used with a high degree of success in some clinics.[27,28] Our experiences with it have been rather limited. Its greatest place is in the patient with bleeding in the last trimester who has a premature infant. Visualization of the placenta, when possible, simplifies the diagnosis. The significance of the placental position in producing malpresentations has been clearly established by excellent x-ray studies.[26,29]

It has been demonstrated by x-ray that a posterior placenta previa greatly decreases the available space at the plane of the inlet and may prevent vaginal delivery[30] *(Fig. 9)*. X-ray localization of the placenta beneath a previous cesarean section scar indicates that the patient is a more probable candidate for uterine rupture. Any patient with that entity should not be allowed to go into labor.[25]

The diagnosis of abdominal pregnancy can be greatly facilitated by the use of x-rays. Abnormal attitudes of the fetus, lack of a uterine shadow surrounding the fetus, the presence of fetal anomalies, greater density of the fetal skeleton than normal, proximity of fetal parts to the sacrum, and the presence of bowel shadows overlying the fetus, all aid in suggesting the diagnosis of a late ectopic gestation.[31]

Incidental x-ray findings include the diagnosis of calcified myomata, the presence of tumors of the ovaries (particularly dermoids, if teeth and bone are present) and anomalies, calculi, and physiological abnormalities of the urinary tract.

SUMMARY

(1) The maternal pelvis can be most accurately measured by x-ray pelvimetry.

(2) When the pelvic capacity has been accurately determined, the management of any labor can be conducted with greater safety for the mother and fetus.

(3) When x-ray pelvimetry is used to augment clinical judgment, the indications for cesarean section are more specific and the incidence of cesarean section is not increased.

(4) X-ray diagnosis is of particular value in determining the exact presentation and position of any fetus.

(5) A positive antepartum diagnosis of multiple gestation can be made only by means of x-rays.

(6) Placentography is justifiable in many pregnant patients who have bleeding in the last trimester.

(7) The roentgenologist and the obstetrician must work as a team if the best results are to be achieved from the use of diagnostic x-rays in pregnancy.

BIBLIOGRAPHY

1. Jones, O. Hunter: The Value of X-Ray Studies of the Pelvis in Obstetrics. Amer. J. Obst. & Gynec., **54**:776, 1947.
2. Kerr, Munro J. M.: The Investigation and Treatment of "Borderline" Cases of Contracted Pelvis. J. Obst. & Gynaec. of the Brit. Emp., **55**:401, 1948.
3. Weinberg, Arthur; and Scadron, Samuel J.: The Value of Pelvioradiography in the Management of Dystocia. Amer. J. Obst. & Gynec., **46**:245, 1943.
4. Colcher, A. E.; and Sussman, Walter: Changing Concepts of X-Ray Pelvimetry. Amer. J. Obst. & Gynec., **57**: 510, 1949.
5. Kaltreider, D. Frank: The Diagonal Conjugate. Amer. J. Obst. & Gynec., **61**:1075, 1951.
6. Baird, Dugald: Preventive Medicine in Obstetrics. New Eng. J. Med., **246**:561, 1952.
7. Lubin, Samuel; Waltman, Richard; Tisdall, Leslie; and Reynolds, Samuel R. M.: An Evaluation of Intravenous Pituitrin. Amer. J. Obst. & Gynec., **64**:248, 1952.
8. Isaacs, I.: Roentgen Pelvimetry by Differential Divergent Distortion. Am. J. Roentg., **63**:669, 1950.
9. Mengert, W. F.: Estimation of Pelvic Capacity. J.A.M.A., **138**:169, 1948.
10. Weinberg, Arthur: Midforceps Operations. J.A.M.A., **146**: 1465, 1951.
11. Dyer, Isadore: Clinical Value of X-Ray Pelvimetry. Amer. J. Obst. & Gynec., **60**:302, 1950.
12. Eastman, N. J.: Pelvic Mensuration, A Study in the Perpetuation of Error. Obst. & Gynec. Survey, **3**:301, 1948.
13. Williams, Rohan: The Radiological Diagnosis of Disproportion. Brit. J. Radiol., **16**:173, 1943.
14. Moir, J. Chassar: The Diagnosis and Treatment of Disproportion. Mod. Trends in Obst. & Gynaec., Ed. by Kenneth Bowes. p. 250. New York: Paul B. Hoeber, Inc. 1950.
15. Savage, John E.: Clinical and Roentgen Pelvimetry—A Correlation. Amer. J. Obst. & Gynec., **61**:809, 1951.
16. Hanson, Samuel: The Transversely Contracted Midpelvis with Particular Reference to Forceps Deliveries. Amer. J. Obst. & Gynec., **32**:385, 1936.
17. Weinberg, Arthur; and Scadron, Samuel J.: The Value and Limitations of Pelvioradiography in the Management of Dystocia—With Special Reference to Midpelvic Capacity. Amer. J. Obst. & Gynec., **52**:255, 1946.
18. Eller, W. C.; and Mengert, W. F.: Recognition of Midpelvic Contraction. Amer. J. Obst. & Gynec., **53**:252, 1947.
19. Weinberg, Arthur: Radiological Estimation of Pelvic Capacity. Obst. & Gynec. Survey, **7**:455, 1952.
20. Grossman, M. E.: The Role of Radiology in Obstetrics. Practitioner, **159**:22, 1947.
21. Adair, F. L.; and Scammon, R. E.: A Study of the Ossification Centers of the Wrist, Knee and Ankle at Birth, With Particular Reference to the Physical Development and Maturity of the Newborn. Amer. J. Obst. & Gynec., **2**:35, 1921.
22. Young, Raymond L.: Abnormal Presentations Among Malformed Infants. Amer. J. Obst. & Gynec., **52**:419, 1946.
23. Dippel, A. L.; and King, A. B.: Errors in Diagnosis of Hydrocephalus in the Breech Presentation. Amer. J. Obst. & Gynec., **38**:1047, 1939.
24. Barter, Robert H.: Dystocia Due to Fetal Abnormalities. M. Ann. District of Columbia., **21**:181, 1952.
25. Davidson, Charles N.: Roentgen Determination of Fetal Death (Gas Within Fetus) and Uterine Rupture. Amer. J. Roentg., **62**:837, 1949.
26. Javert, C. T.: Erythroblastosis Neonatorum; Obstetrical-Pathological Study of 47 Cases. Surg., Gynec. & Obst., **74**: 1, 1942.
27. Stevenson, Charles S.: X-Ray Visualization of the Placenta: Experiences with Soft Tissue and Cystographic Techniques in the Diagnosis of Placenta Previa. Amer. J. Obst. & Gynec., **58**:15, 1949.
28. Stallworthy, John: The Dangerous Placenta. Amer. J. Obst. & Gynec., **61**:720, 1951.
29. Stevenson, Charles S.: Transverse or Oblique Presentation of the Fetus in the Last Ten Weeks of Pregnancy: Its Causes, General Nature, and Treatment. Amer. J. Obst. & Gynec., **58**:432, 1949.
30. Stallworthy, John: Discussion of Placenta Previa. Proc. Royal Soc. Med., **39**:551, 1946.
31. Bourne, A. W.; and Williams, Leslie: Recent Advances in Obstetrics and Gynecology. p. 207. Philadelphia: The Blakiston Company, VII Ed. 1948.

DISCUSSION *(Abstract)*

Dr. Walter L. Thomas, Durham, N. C.—We are in complete agreement with the authors as to the tremendous value of radiography in obstetrical diagnoses. We also like very much their positive indications for these x-ray examinations. Speaking of indications, we wish to emphasize that these should be very definite and positive. We feel that x-ray examinations of the abdomen and pelvis of the pregnant woman should be limited to the fewest possible exposures because of fetal radiation hazard. There is always the danger of radiation damage to the fetus. We should be aware that x-rays may damage the embryo and even the non-pregnant uterus and ovaries. Goldstein and Murphy as early as 1929 reported 28 prenatal injuries in human fetuses as the result of therapeutic radiation to the mother. Most of the damage occurred in those irradiated prior to the fifth month. We advise, therefore, that no therapeutic radiation be administered to the pelvis during pregnancy and that radiography of the pelvis should be kept to the minimum. Specifically, we believe that radiography be employed for pelvimetry and other studies only during the late stages of pregnancy and then only in the presence of positive indications.

The essayists say that when x-ray pelvimetry is used to augment clinical judgment, the indications for cesarean section are more specific and the incidence of cesarean section is not increased. This is true for the trained obstetric specialist. However, we are certain that many sections over the country are done unnecessarily by the non-specialists solely upon the roentgen diagnosis of small or borderline pelvis. No real clinical judgment is exercised and the patient is given no trial of labor. Thus, the incidence of cesarean section in general is probably increased by the use of roentgen pelvimetry.

The authors say that their experience with placentography has been limited. We have employed radiography frequently and with a high degree of success in the localization of the placenta. Dr. Robert Reeves, our roentgenologist, uses lateral radiography with a graduated opaque filter to achieve maximal contrast of the soft tissues. He feels that the exposure is better made with the woman's breathing suspended at deep inspiration. He finds that this causes the uterine axis to become more horizontal and that this in turn carries the posterior uterine wall away from the vertebral column thus permitting better visualization of the posterior and inferior margins of the placenta. If the placenta is not localized with this technic, cystography with air or neoiopax® is done. The accuracy with these technics is almost perfect: 95 per cent in over 600 patients.

The authors have recommended that placentography be employed in those patients with previous cesarean section before permitting them to go into labor, contemplating a vaginal delivery. They also contend that any patient with the anterior location of the placenta beneath the previous cesarean scar should not be permitted to go into labor. The following patient is reported to illustrate just how correct they are with these recommendations.

A 36-year-old white gravida 2, para 1-0-0, was submitted to a repeat cesarean section two weeks prior to her calculated date. Roentgen pelvimetry revealed a large gynecoid pelvis. Her post-obstetric history showed that three years before a classical cesarean section was done elsewhere for a late pyelitis of pregnancy and a "brow presentation." The infant was a stillborn. She apparently ran a very morbid postoperative course presumably due to her urinary tract infection. The repeat section was a laparotrachelotomy. The uterus appeared grossly normal with no adhesions. A living infant was easily delivered. The placenta which was anterior beneath the classical vertical scar did not separate. When it was manually removed the old classical scar separated completely throughout its entire length. You well know the story and outcome if this patient had been permitted to go into labor. We were lucky.

Dr. Ralph E. Campbell, Madison, Wis.—Doctor Barter is a Wisconsin product and a former resident of mine. He has certainly given us the impression that x-ray pelvimetry is an adjunct in the over-all problems of x-ray diagnosis in pregnancy. I agree with him.

Dr. Louis H. Douglass, Baltimore, Md.—It is our feeling that x-ray pelvimetry should be routine in the primigravida; it should be routine in the multigravida who has not had it before.

Dr. Barter gave a long list of indications for x-ray pelvimetry. I think he would have been very much better off if he had just said all of the cases. Diagnostic x-ray does no great harm to the baby, or to the ovaries of the mother. At least we have never seen any evidence of it.

I can see only one objection to x-ray pelvimetry as a routine, and that is the cost of it, but actually, it is an insurance.

Many excellent obstetricians tell us that they evaluate the pelvis clinically and then x-ray those that appear to need it. Recently, we ran a series of cases of x-ray pelvimetry and we coordinated the diagonal conjugate as measured by the obstetrician with the actual diagonal conjugate as measured by the x-ray. We found there was a difference of anywhere from 0.5 to 2.5 to 3 cm. of error, and that those diagonal conjugates which were measured by the practicing obstetricians, the specialists, and those measured by the house staff showed practically no difference in error. As a matter of fact, the house staff was a little bit better than the practicing obstetricians. So there is a real difference there.

In addition to that, our findings showed us that the old idea of subtracting 1.5 cm. from the diagonal conjugate to give the true conjugate was far from being correct. Again, there was an error of as much as 0.5 up to 3 or 3.5 cm.

A few years ago one of our patients was scheduled for home delivery in the country and was sent into the hospital because of toxemia. In the hospital, we had x-ray pelvimetry, and we found that she had a markedly contracted mid-pelvis, which had not been suspected before by anyone. If she had not developed toxemia, she would have been allowed to go into labor at home, probably would have had a long labor and a difficult or impossible forceps delivery with a stillborn baby.

I believe it is more important for the patient who is to be taken care of by the general practitioner to have x-ray pelvimetry than for those being taken care of by the obstetrical specialist. Eliminate those cases that are doubtful and refer them to somebody who is competent to handle them, and let the man in general practice take care of those cases in the home which appear to be normal.

Dr. Barter (closing).—In regard to Dr. Thomas' remarks, about harming the fetus with x-rays, we feel the same way that he does about not doing pelvimetry until the last month, although the damage to the fetus is remote during the entire last trimester.

It has been shown that with x-ray pelvimetry the fetus receives only a remarkably small amount of radiation. Furthermore, there is really no indication to do the x-ray pelvimetry until late in pregnancy.

We give due credit to Dr. Savage and his associates for their extremely valuable paper and their clinical correlation of the manual findings of pelvic diagnosis when compared with x-ray findings. In that regard, until one becomes thoroughly familiar with x-ray pelvimetry, he is not aware of how far amiss he can be in the clinical evaluation of the patient's pelvis. Sometimes it is almost unbelievable.

I also wish to give credit to Dr. Savage for the statement in our paper, about the effect of the placenta underneath a previous cesarean section scar. It is an excellent idea, but it was his originally.

A REPORT ON THE CYTOLOGY OF FIFTY-EIGHT HUNDRED VAGINAL SMEARS*

By LEE F. TURLINGTON, M.D.†
W. CLARE BARCLIFT, M.D.
and
HUNTER M. BROWN, M.D.
Birmingham, Alabama

In March 1947 the taking of vaginal smears for the cytological diagnosis of early cancer

*Read in Section on Gynecology, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

†Associate Professor of Clinical Gynecology, Medical College of Alabama, Birmingham, Alabama.

was started in our office. Dr. J. A. Cunningham, who had had some experience with the study of these smears, and his associate, the late Dr. Louis Posey, agreed to do this work. This service was offered to every patient who came to the office. When one thousand sets of smears had been studied without finding a case of cancer that did not have clinical signs or symptoms, it was thought that something was wrong. About that time one of the group was in New York and had the privilege of a talk with Dr. Papanicolaou, who proposed that the smears about which we were in doubt be sent to him for review. He examined fifty sets of smears and did not diagnose a case of cancer. He made some suggestions about the stain and the thickness of the smears that were most helpful.

After examining one thousand sets of smears it was decided to take smears only on those women who were thirty or more years of age. The first case of carcinoma of the uterus that we had not suspected was found in smear set No. 3197, a carcinoma *in situ* of the cervix.

A device which has saved a great deal of time is a mimeographed sheet which is given to each patient to read just after her history has been taken. This advises, for the purpose of reducing mortality from cancer, a periodic check-up examination each year on all patients under thirty-five years of age, and twice a year after they reach that age. It explains how vaginal smears can lead to the early diagnosis of cancer and advises that they be taken once a year after age thirty. Particular emphasis is laid on the fact that a request for repeat smears or for a biopsy does not mean that a patient has cancer, especial emphasis being laid on the possibility that the smears may be inadequate for the cytologist to give an evaluation. It is an important consideration to avoid if possible any psychic reaction of the patient who is told to come in for repeat smears.

It was decided to take a set of three smears; first a vaginal smear is obtained from the posterior formix, then by suction, using a syringe and cannula, material for a smear is obtained from the cervical canal and finally, a smear is obtained from the squamo columnar epithelial junction, using a wooden spatula devised by Ayers. The usual technic is followed in that the smears are immediately immersed in a jar containing equal parts of alcohol and ether.

If smears are reported atypical, repeat smears are obtained as quickly as feasible, care being taken not to alarm the patient. If these repeat smears are reported as positive or still atypical, the patient is asked to return immediately and the situation is explained to her or her husband and she is admitted to the hospital for necessary biopsy and curettement. A conical biopsy, using a cold knife, taking care to include the squamo columnar epithelial junction is taken, along with the endocervical and endometrial curettings which are sent to the pathologist's laboratory for a twenty-four hour report on paraffin prepared sections. The biopsy is cut radically from the center making blocks for 1.5 to 2 mm. in thickness. These blocks are mounted in paraffin and one to three slides are taken from each block for study.

In the first few months Drs. Cunningham and Posey had to work out a few questions in interpretations; for instance, the cases that had vaginitis were at first reported with atypical cells, but when they were given appropriate treatment the smears returned to normal.

Two years ago Miss Mary Wells, who has been the technician handling these smears in Dr. Cunningham's laboratory for several years, was sent to the Deaconess Hospital laboratory in Boston for the study of cytology under Miss Middleton. She was later reported by Miss Middleton as being a competent cytologist and perfectly fitted temperamentally for her work. (I am told that it requires a certain temperament to sit and study one slide after another all day.) In the last 2,600 sets of smears, five carcinomata *in situ* have been diagnosed, three in the last thousand.

After this experience in the last series of smears, it was thought that perhaps the cytologist, having had more experience, might review the atypical smears of the first three thousand and change his interpretations in some instances. Miss Wells has reviewed the atypical smears that occurred in the first three thousand cases and has consulted with Dr. Cunningham in many instances and they have not found one set that showed tumor cells. The fact that coincidence has played

a part in this series of cases demonstrates the fact that many thousands of cases should be studied before drawing any definite conclusions.

It is estimated that the 5,800 sets of smears represent about 3,500 patients. For the purpose of classification, the smears are divided into four groups: positive, doubtful-positive, suspicious or atypical cells, and, finally negative.

Table 1 represents sets of smears collected from March, 1947 to January 1950. Included in this series of smears are thirteen cases that had obvious signs and symptoms of cancer, which would have indicated biopsy even if smears had not been taken. These cases were included as a check on cytologic tests. Of the thirteen cases, twelve were easily picked up on smears. One case was missed completely. Our pathologist has rechecked this set of smears several times, but still has been unable to find cancer cells present. This particular case was a rather extensive cervical carcinoma with marked surface necrosis present and it is perhaps for this reason that no cancer cells were found. The other case in the positive smear group was that of our first carcinoma *in situ*, which was found in smear set 3,197.

In the doubtful positive group, there were 45 cases, 5 of which were confirmed by biopsy and curettement as being positive, while 40 cases were confirmed by biopsy and curettement as being negative. Of the 5 positive cases, 2 were fundal carcinoma and the other 3 were invasive cervical cancers. Of the 2 fundal cancers, one was an adenoma malignum and the other an adenocarcinoma.

In the atypical group of 52, there were no cases confirmed as positive. Our procedure in such cases is to get another smear and if the smears are still reported as atypical, a biopsy is taken and a diagnostic curettage is performed. If they are reported negative, the charts are marked with red flags and special attention is given them on later examinations.

In the negative group of 3,164 sets of smears, 5 cases were confirmed as having positive cancer. In this group there were a number of patients who had biopsies and curettements even though the smears were negative, and it was for this reason that the four fundal carcinomas were diagnosed. Two of these cases had adenoma malignum, which in its early phases has very few exfoliative cells. The other two cases were adenocarcinoma of the endometrium, while the cervical carcinoma was the obvious case which has been mentioned above.

Table 2 represents sets of smears collected from January 1950 to November 1952. In this series there were no cases that had obvious signs and symptoms of cancer. In the positive smear group there were 6 cases, 4 of which were confirmed by biopsy and curettement. Of the 4 positive cases, there were 2 cases of carcinoma *in situ*, while the other 2 were invasive cervical cancer.

In the doubtful group, there were 11 cases, 4 of which were confirmed by biopsy and curettement as being positive, and 7 cases were confirmed as negative. Of the 4 positive cases, 3 were carcinomas *in situ*, one case being an invasive carcinoma of the cervix.

In the atypical group there were 42 cases and there were no positives. The same procedure was carried out here as was described in *Table 1* for the atypical smears.

In the negative group of 2,477 sets of smears, 2 cases were confirmed as positive. These two cases had atypical bleeding and curettement, since they both were adenocarcinomas of the fundus.

In all we had 9 cases of carcinoma *in situ*. Of the 9 cases, 6 received cytologic study, and 3 were found to have positive smears which

MATERIAL 1947-50
(3273 sets of smears)

Positive	13	Doubtful	45
Confirmed	13	Confirmed as positive	5
		Confirmed as negative	40
Atypical	51	Negative	3164
Confirmed as positive	0	Confirmed as positive (1 cervical carcinoma 4 fundal carcinomas)	5

NOTE: 13 cases obvious carcinoma

TABLE 1

MATERIAL 1950-52
(2536 sets of smears)

Positive	6	Doubtful	11
Confirmed as positive	4	Confirmed as positive	4
Confirmed as negative	2	Confirmed as negative	7
Atypical	42	Negative	2477
Confirmed as positive	0	Confirmed as positive (2 fundal carcinomas)	2

NOTE: No cases obvious carcinoma

TABLE 2

were confirmed as positive by biopsy. Three cases were found in the doubtful positive group and were also confirmed by biopsy. The other 3 cases were found by routine study at the time of a conization or cervical amputation.

It has been customary in the practice of this group to advise all patients with even a moderate amount of cervicitis to have the diseased tissue removed by cauterization or by conization. No member of this group (and this practice has been common for one member since 1919) has seen a carcinoma develop in a cervix that has been so treated. It is only natural that this experience has had its effect on this group in their treatment of carcinoma *in situ*. Of the nine cases that have been encountered, three were in young women, who were treated conservatively because they wished further pregnancies. One of these has since borne a baby; another has had a pregnancy which developed normally until the fourth month and then eventuated in a miscarriage, but she still hopes to have a baby. All three of these cases were kept under close observation by cytologic examinations and by biopsy. When the third case continued to have atypical vaginal smears and repeated pink discharge she was hysterectomized, it is feared for the comfort of the gynecologist as much as for the safety of the patient. The other patients, being in the older groups, who did not desire further pregnancies, were treated, four by total hysterectomy and two by radium.

There is still some difference of opinion amongst pathologists as to what histologic picture represents carcinoma *in situ* and what represents metaplasia. Consultations amongst pathologists have been frequent in arriving at conclusions on these nine cases.

The gynecologist who treats carcinoma *in situ* conservatively must necessarily have a tremendous faith in the pathologist who reports on his cases. It is thought that the young woman who wishes further pregnancies should have the entire situation explained to her and to her husband. If it should be decided that she is to be treated by trachelectomy, she and her husband should be thoroughly impressed with the importance of further checking for the possibility of recurrence by vaginal smears as well as by physical examination.

An account has been given of the development of a cytology service in the office of three gynecologists who see an average cross section of private practice. Attention has been called to the irregularity of occurrence of cases of carcinoma in a given series and to the necessity of considering many thousands of cases before drawing conclusions. Carcinomas *in situ* of the cervix that have occurred in this practice have been briefly reported and the method of treatment outlined.

CARCINOMA *IN SITU*

Positive	3	Doubtful	3
Confirmed as positive	3	Confirmed as positive	3

Three cases carcinoma *in situ* in which no smears were taken for cytology

NOTE: Total smears 1947-1952—5809

TABLE 3

DISCUSSION *(Abstract)*

Dr. J. Ernest Ayre, Miami, Fla.—The variation in number of cancers found in different screening groups commands evaluation of pertinent factors. It is known that cervix cancer is more frequent in the South than in the New York area. It is well known that in a Jewish population group, the incidence of cancer of the cervix is very low. There is evidence to indicate that screening a well-to-do private clientêle will yield less cervical cancer than will charity gynecologic clinic groups. Dr. Turlington's paper emphasizes another important factor: incidence of cancer of the cervix may be low in his group of women who received treatment of cervical infections promptly with electrocautery and electroconization. A measure of cancer prevention may be secured with these methods.

The sampling method employed is of considerable importance. The vaginal smear is not identical as a sampling method to the cervical cell-scraping. Two separate investigators (Kulcsar and Reagan) have now demonstrated the striking difference in accuracy between the vaginal smear, the cervical smear, and the surface cell biopsy. Comparing sampling methods then, it was found that the single vaginal smear slide was correctly positive in 55 per cent, the cervical smear was positive in 74 per cent, and the surface cell biopsy was positive in 93 and 94 per cent.

I should like to quote from a paper presented before the University of London Institute of Obstetrics and Gynaecology recently. This gives the results of screening for cancer of the uterus in 280 physicians' offices in Dade County. Cytologic and histologic results are presented, and the statistics have been evaluated by Reinhold Wolff of the University of Miami, Consulting Statistician to the Institute, and Dr. John E. Dunn of the National Cancer Institute. A uniform technic was used, namely, two cervical cell scrapings on each patient. The slides were

mailed to the Cytology Center in the Dade County Cancer Institute. In 10,556 tests on 5,278 consecutive women (many taken routinely), 89 (or 1.69 per cent) were shown to have histologic cancer. Eighty-five (or 95.5 per cent) of these were diagnosed primarily by the cell-scraping. It seems significant that 48 of the 89 malignant lesions were estimated to be early and definitely curable on the basis that 34 were totally unsuspicious, while an additional 14 were quoted in the histologic report as being "early" or "extremely early."

Why so much cancer? The inadequacy of basing the cancer search upon symptoms is clearly demonstrated by the fact that almost as much uterine cancer (1.3 per cent) was found in those cases clinically negative as was found in the group with clinical findings (2.1 per cent).

Cervical cytology is put forward as a cancer case finding procedure having more favorable potentialities than any other known method.

More detailed breakdown of the figures is to be found in the Dade County Cancer Institute exhibit.

It seems clear that the time has now been reached when we must say that no cancer examination is complete without a cervical cytologic test, and further that every gynecological examination on a new patient should include cervical cell study. A measure of cancer prevention in the cervix may be attained by prompt attention to chronic infections and, as pointed out by Dr. Turlington, the use of the electrocautery and electroconization.

Dr. Barclift (closing).—Even though there have been fewer cases of carcinoma diagnosed in our series of cytological studies than in some others reported, we feel that the taking of vaginal smears is of definite advantage to our patients. It also emphasizes the importance of periodic examinations.

This report shows what a gynecologist may accomplish in any locality where he has the services of a pathologist who is willing to familiarize himself with the Papanicolaou method of cytology.

MANAGEMENT OF POLYCYSTIC DISEASE ON AN AMBULATORY BASIS*

By JOHN H. DOUGHERTY, M.D.
Knoxville, Tennessee

The discussion of polycystic disease must of necessity bring into review principles of long standing and knowledge familiar to all of us. Consequently, I ask your indulgence for the time taken at this moment and in the subsequent discussion of this paper to reiterate known principles relative to this disease. Many of us might say that polycystic disease is a dry subject and comparable to the problem of brain tumor in that although the condition is of unusual academic interest to all of us, most patients who appear with it have a short and restricted life following the diagnosis. However, the care of these patients and the possibilities of making them more comfortable and perhaps in a small way adding a few short days to their lives is an intriguing stimulus, I am sure. In presenting this paper to you, the latter is a paramount consideration.

Etiology.—Although there have been numerous publications upon the subject, I believe that time may be taken to review the embryological development of this disease. There are several theories in the literature to explain just how cysts of both kidneys form, and for that matter just how cysts of any organ in the body form which has a ductal system with a secretory epithelial lining. Of the many theories as to the etiology, three are most popularly accepted and one, that of Dr. Arthur C. Allen, seems to me to be the most probable. The first two, one of Ribbert and the theory of McKenna and Kampmeier, do not entirely explain the embryological appearance of cysts. Ribbert postulates that projections from the ureteral bud failed to connect with the developing secretory portion of the nephron in the primary nephrogenic tissue. This explanation would lead one to believe that the cysts would appear only in one stratum of the kidney itself, namely, the cortex. The second theory, that of McKenna and Kampmeier, holds that some of the developing primary secretory units of the kidney are doomed to atrophy and that for some peculiar reason they do not do so and secretion takes place in them forming cysts. This is not an entirely adequate explanation since it also localizes the appearance of the cysts to one stratum of the kidney and places the development of the cysts in the retention of a primitive structure which would not be incorporated in the metanephric unit as we know it in human anatomy. In contradistinction, the theory of Allen explains adequately the production of the cysts and the subsequent development of the entity which we begin to know clinically as the disease in the various stages of life. Allen postulates that penetrations from the ureteral bud reach the primordium of the nephrotome and there clusters of cells begin to grow about them forming the glomerulus or the secretory unit of the neph-

*Read in Section on Urology, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

ron. Cysts result because of an abnormal development of the secretory unit. Atresia or failure of canalization takes place at different levels along the nephron so that ultimately cysts may appear in any stratum of the kidney itself, and in true polycystic disease cysts would appear both in the medulla and in the cortex. Allen's theory is more recent and adequate and would also explain why the cysts themselves vary in size. It is conceivable that those which developed earliest would have more fluid while those developing later would have less fluid since the development of the entire mass of cysts would eventually place some limitation on size and fluid content.

Incidence.—Polycystic disease is not an infrequently occurring phenomenon and is variously reported to occur from autopsy findings to one in every two hundred persons. Indeed the incidence given by Campbell in his extensive study of children is that there is one case in every two hundred and fifty births. Other reports place the incidence lower, one in each three hundred and fifty persons born. Some observers hold that unilateral polycystic disease may occur. There have been few definitely positive cases reported. There are cases on record in which multiple cysts have been found to exist in one kidney but none in the opposite kidney. Whether or not there were also cysts of other important organs of the body in these cases has not been stated. Obviously the proof of whether or not polycystic disease occurs in only one kidney would depend on the absolute demonstration of the absence of cysts in the opposite kidney or in other vital organs of the body. Various reports have been made of the existence of unilateral polycystic disease in as many as 20 per cent of cases of known polycystic disease. It is believed that this is too high and that the condition rarely exists. In going over my records and collected data there have been one hundred seventy-two patients with one or more signs or symptoms that might be found to exist in polycystic disease. Out of this group, there have been thirteen proven cases of polycystic disease and twenty-seven cases of presumptive and reasonably conclusive cases of this abnormality. During the course of this paper, I will show you graphic presentations of the data which I have collected in my study and care of these patients. The incidence of the disease in my hands has been approximately that of other urologists, namely, about 1.4 per cent.

DIAGNOSIS

(A) *Historical Information.*—In the collection of historical data from any patient, one would reasonably suspect the possibility of polycystic disease if an individual reported that the condition had previously occurred in a member of his family, and if there was a history of unexplained hypertension or unexplained urinary disturbances in relatives. Currently in office practice, the young individual most often will later have polycystic disease. The clinical divisions are those of early childhood, those predominantly in middle life, from twenty to forty, and those in older age groups from forty to sixty. The largest number of patients will probably be found in the middle group with ages varying from twenty to forty. They present themselves with the complaint of abdominal symptoms, ofttimes indigestion, back pain, headache, varying degrees of hypertension, cells in the urine, and possibly bulging and palpable masses in the flanks. All of these factors vary and all of them are seldom seen on one patient. However, in the advanced stages of the disease almost all may be present. The history is usually a complaint of some of these signs and symptoms or simply a patient wishes to be examined because he has a relative who had the disease.

(B) *The Physical Characteristics.*—In my experience patients have often been well developed individuals, usually somewhat overweight, of a florid appearance, somewhat excitable and hyperactive, with a moderate elevation of blood pressure, as an average usually 170/100, with a vague complaint of bilateral flank pain, lumbar pain and tenderness, some aberration in urinary function, and cells in the urine. There may be associated changes in other systems. The liver may be palpable; there may be eyeground changes; and there may be abnormal fluid deposition. The appearance of eyeground changes, vascular abnormalities and skin pigmentation usually signifies the effects of a superimposed disease within the kidney such as pyelonephritis or interstitial nephritis or the morbid process secondary to cyst formation within the liver, the spleen, the adrenal, or other vital organs

within the body. It is significant to note that hypertension is frequently absent.

(C) *Laboratory Data.*—These are principally detectable in the urine. However, the urine may be entirely negative and is often so in the early stages of the disease. When the urine begins to show abnormal findings such as protein, red blood cells, white blood cells, casts, bacteria, and various exudative abnormalities, they are usually a result of other changes which have taken place in the kidney from infection or compression resulting from the enlarging cysts. Blood is a frequent finding in the late stages of the disease. Obviously one should bear in mind the possible co-existence of another abnormality such as tuberculosis, tumors, stones, or infection. Also there may be elevation of the blood nonprotein nitrogen resulting from renal insufficiency because of the compressing cysts. Along with this, there would be elevated blood levels of other constituents such as creatinine, which appear in the morbid process.

(D) *Laboratory Tests.*—The important technical findings of significance in this problem are those to be gained by x-ray studies. Excretory urography will often be of value, but most frequently renal sufficiency has reached such a low point that concentration of the media is not helpful as far as outlining the collecting portions of the kidney. However, this in itself when coupled with other positive findings may be of value. On the other hand retrograde study is almost always necessary and will yield the positive roentgen picture of the bilateral process. The calices appear distorted; they are usually elongated; the infundibula are usually compressed upon; concentric invaginations appear as compression of the cysts is active; the pelvis may be distorted; and the cysts may so compress some portions of the drainage system that the outlines are completely obliterated and more distant areas appear detached, but the channels between the two areas of media are simply narrowed because of the compressing cysts. An x-ray of the chest may also show some cystic areas, and in peritoneoscopy an effort to determine the character of liver enlargement may show cysts situated on its edge.

Explanation of Symptomatology.—The physical symptoms of this disease appear usually because of two processes. One of these, the enlarging masses in either flank which by the pull on the pedicle of the kidney, by the distortion of the abdomen, by the invagination into the peritoneal cavity, by the enlargement of the liver, and by the interference with the function of the circulatory, gastrointestinal, and ofttimes the respiratory systems produce the distressing signs and symptoms frequently seen. The other group of symptoms is the result of changes in the renal parenchyma of compression by the cysts and they are usually manifest by elevations of blood pressure, with psychic and vascular changes such as nervousness, unusual emotion, headache, and easy fatigue. Associated with this phenomenon are the findings in the urine principally and in order of frequency: red and white blood cells, casts, protein, and subsequently positive bacterial growths when invaders move in to an avascularized vital tissue. In the early stages of the disease as long as the compression of renal tissue has not been so great as to destroy function of an adequate nature, the predominating signs and symptoms are those of the former group. However, as compression becomes greater and renal function begins to deteriorate, the signs and symptoms of the latter group predominate and finally in the acute stages the patient appears with all the signs and symptoms of uremia culminating in the cessation of life.

Uromedical Management. — Because the principle symptoms and the methods for definite diagnosis are usually urologic, the management of the majority of these patients often falls to the hands of the urologist. The principle care is from a uromedical standpoint. However, the urologist must always be alert to the possible necessity for urosurgical demands. In this type of care from a uromedical standpoint, my experience has been the necessity for counsel, advice, and general morale building. The important thing for the patient doomed to die with polycystic disease is that he have someone on whom he can depend to supply his needs for pain relief, headache, advice as to dietary and bowel hygiene, and explanation of the distressing signs and symptoms as they inexorably appear. Many of these patients fall into the same category as the patient doomed to die of cancer. They should have whatever is necessary to relieve them of their pain and distress. In addition to this, sufficient time should be taken to prepare them for the necessity of

further care when the need for it appears, and I believe that our insurance companies with a plan for voluntary insurance must some day in the future be extended to these patients. As we all know, patients with polycystic disease will probably need hospitalization, in order to die with some comfort, as their end approaches. The majority of them cannot obtain insurance because their disease is discovered at such an age group that they have not had time to consider insurance. As a result, many of them are unable to obtain anything but charity care. The same consideration is also necessary to give proper advice and counsel in maintaining work that will give them a livelihood throughout their ambulatory course. This might extend over a number of years. One case has been reported to have had known polycystic disease for fifteen years and to have shown signs and symptoms of uremia for only three years. One of my patients had the disease in active stages and worked as a clerical employee for five years before a Goldstein operation was done in an attempt to prolong life. The general reaction to the diagnosis of polycystic disease at the present time both in lay and professional groups is to accept the forecast that the patient is doomed and that little or nothing can be done to make remaining life worth while. Under such circumstances, proper regard is replaced by an indifference, for which one might be reasonably criticized.

Urosurgical Management.—In the consideration of this matter, it is obvious that there are varied opinions. Some surgeons believe that as soon as the disease is discovered one might prolong life by opening either flank and rupturing as many of cysts as possible; all of you are familiar with the plan and care outlined by Dr. Goldstein and by Dr. Rovsing. Essentially, the basic principle in any type of surgical care is to relieve some of the compression on the remaining renal tissue in order to give better circulation and better function with the elimination of degradation products from the body. Usually the performance of surgical procedures upon this principle is delayed until the stages of uremia develop. We have little upon which to draw conclusions as to whether life might be prolonged if the cysts were ruptured in the early stages of the disease. At the moment, I have a young woman under consideration, whose films you have seen, one of whose cysts is distorting and compressing the left renal pelvis and ureter. She has cells in the urine from this kidney and a positive culture for E. coli. There is a negative culture from the right kidney. My feeling is that if the cysts were ruptured on the left side that her condition might be favorably improved. However, she feels well and with the few inconstant signs and symptoms referable to her infectious process superimposed on the polycystic left side, she is active and engaged in her work and is disinclined to have a surgical procedure.

Recently I have continued the aspiration of bilateral multiple cysts after a Goldstein operation had been performed on a patient. I felt that in her uremic state I was simply prolonging misery and ill health. However, she gained some relief after each of these and was able to recover some degree of better health. All in all, no fast and rigid rule can be laid down as to the care of this type of patient or as to whether or not surgical procedures should be advised. The individual situation must be evaluated and it must be determined how one can give the most in service. The aspiration and introduction of sclerosing fluids into cysts has been tried by many with little good result. Some surgeons have also advocated the disruption of cysts with a coagulating current so that they might not reform. This does not help the situation greatly because if the cysts are removed from the surface those below simply have an opportunity to increase their fluid content and continue the disastrous compression that they could not attain while they were retained by the overlying cysts. As to whether or not one kidney should be removed, the matter is certainly open to question. Obviously removing one kidney which may harbour some renal function of a limited total amount from an individual with a condition which cannot be improved would depend on surgical judgment. The condition is not comparable to that of bilateral renal tuberculosis where one kidney might be functionless and a deterrent to any degree of healing or regaining of health if allowed to exist. Rather, the removal of one kidney in polycystic disease is a step to be taken only with the conviction that it is absolutely necessary for the patient. Many patients would prefer to live the remaining span of life free of some signs and symptoms, prin-

cipally pain, rather than to have their life possibly a little longer but still suffer throughout its course. This is a matter, I think, of great importance. Some urological surgeons have proclaimed that the removal of one kidney in polycystic disease is never justified. I think that this is an arbitrary and unnecessary conclusion.

COURSE OF POLYCYSTIC DISEASE

Polycystic disease is usually divided into three categories or groups. The first of these is that when the disease is discovered in a young child. Dr. Campbell[2] has reported a case in a seven-day-old infant. His experience is that after the discovery of the disease, with palpable masses in either flank, life ends within approximately six months. He has had a wide and varied experience with children and has perhaps seen the condition more often in children than any other investigator who is contributing to the contemporary literature.

The second group of patients are those usually seen in the ages from twenty to forty and most often they appear for consultation because of the history that some other member of their family has had polycystic disease. They may have few clinical signs or symptoms but a thorough examination will often detect an abnormality either remotely or directly related to the kidney. It is difficult to place any estimate or prognosis on the problem as it presents itself in this age group, but I believe if there are few clinical signs and symptoms that a matter of years may go by before the disastrous appearance of uremia. I have a patient under observation at the present time whose initial diagnosis was made five years earlier and who has actually improved in some of his clinical signs and symptoms as an effort was made to control the co-existing infection. He presents a moderated elevation of blood pressure but this has declined from the high levels which he presented at the time of the initial examination, and the cells and bacillary findings in his urine have almost completely disappeared. He knows that he has polycystic disease and not infrequently appears with some clipping from the popular literature such as that of the artificial kidney, wishing to know whether I will have that item available for him when his kidneys go bad. He is actively engaged in a demanding clerical position, has a family, owns a farm, and has two children which were born before the diagnosis was made of his disease.

When the condition appears in the third group of individuals in the fifth, sixth, and seventh decade it is not infrequently that the patient presents himself with the signs and symptoms of uremia, but it is often surprising how long these patients will go with comparatively mild uremia, with only the signs and symptoms of easy fatigue, mild anemia, slightly elevated nonprotein nitrogen, and mild aberrations in urinary function without progressing into the acute situation of rapidly advancing renal insufficiency and nitrogenous retention. This is explained on the basis that the cysts enlarge very slowly, and their compressing element is almost insignificantly gradual.

The Histological Picture.—I think it unnecessary to spend too much time here. All of you have seen specimen and pictures of polycystic disease. Some of the graphic presentations which I have shown disclose this to you, but usually the picture is that of cysts varying from less than one millimeter to approximately 10 cm., widespread throughout the cortex and medulla of either kidney, with the larger cysts appearing usually on the surface, and the smaller ones deeper within the kidney parenchyma. Sometimes, however, one kidney may present a large cyst which may even simulate a co-existing neoplastic lesion along with the cysts of varying size. Usually the liver is palpable, and quite frequently the edge will present the characteristic sensation of cysts which, however, is so similar to that of the liver edge studded with carcinoma that one needs supporting evidence to differentiate it from the latter. The vascular tree within the kidney obviously becomes compressed, and the functioning vessels appear much smaller than is usually seen. One of the films which has been shown you presents an arteriogram which I feel is restricted not only as to extent but also as to size of the vessels because of the multiple cysts involving the liver, the pancreas, both kidneys, and probably the adrenal glands in this patient. The ureter may be compressed by cysts protruding down or in some other direction from the enlarged parenchyma. There may also be distortion of its outline by roentgenographic interpretation. The cysts contain a secretion which is an intermediate between serum and urine as it ap-

pears in the bladder. Obviously, it is not urine since there are no communications except by rupture of the cysts into the pelvis. However, the cysts do not contain more constituents in their fluid when a patient is in uremia than they do at other times. In fact an analysis of cyst fluid shows it to be consistently uniform, percentages being relative to the normal pattern of the circulating blood. There may be discoloration of the fluid, but it is usually straw-colored of a rather high specific gravity and is usually clear. Cloudiness is usually the result of bleeding or when there is inadequate functioning renal tissue. Intravenous media for urographic interpretation does not enter the cysts at all but is cleared in the usual way with urine production. Because of the histopathology of the condition, there is not only a decrease in the function of the kidney itself, but deprivation of nutrient supply to the kidney so that the shunt mechanism of Trueta is interfered with. As a result of this, retrograde manipulations need be cautious and carefully done in order to minimize trauma so that there may not be a reaction and the necessity for the shunt mechanism to appear in order to carry the kidney during the period of recovery.

The Terminal Picture.—An individual with polycystic disease passes into the stage of uremia with variations according to prognostic possibilities. As the picture of uremia develops, all systems become involved and the patient may die a cardiac death, a respiratory death, or there may be cerebral hemorrhage with the cessation of vital functions from a central standpoint; but during the end stages, there are always acute signs and symptoms referable to the gastrointestinal system. Nausea and vomiting are often most troublesome and appear at the slightest suggestion by a hopeful and well-wishing relative that the patient take just a little nourishment to help out. Usually the blood pressure rises as the nonprotein nitrogen goes up. Along with the elevation of nitrogenous products other degradation products, particularly creatinine, begin to mount in the blood. An individual may live for a long time with a slowly increasing nonprotein nitrogen. Many patients develop very high blood retention of nitrogenous products. Blood nonprotein nitrogen as high as four hundred may be seen in the terminal stages of polycystic disease. Bleeding from mucous membranes is often evident and skin irritations, particularly pruritus, are not uncommon. Edema is not so frequently seen as in patients with other types of renal disease.

SUMMARY AND CONCLUSION

Thirty-four cases of the bilateral renal polycystic disease have been presented, thirteen of which were definitely proven. Methods of diagnosis, and the uromedical and urosurgical management and classification of cases have been discussed.

REFERENCES

1. Allen, Arthur C.: The Kidney: Medical and Surgical Diseases: New York: Grune & Stratton, 1951.
2. Campbell, Meredith: Clinical Pediatric Urology. Philadelphia & London: W. B. Saunders Company, 1951.

517 West Cumberland Avenue

DISCUSSION *(Abstract)*

Dr. Haynes Baird, Charlotte, N. C.—I should like to know whether anyone here has ever seen or heard of a case of polycystic disease of the kidney associated with renal stones.

At times it is very difficult to differentiate polycystic disease from renal tumor, especially if it is unilateral. This was especially true prior to the advent of aortography.

A patient of mine, a sixty-three-year-old white woman, presented a large mass in the left upper quadrant with a history of gross hematuria on a few occasions. There was no history of genito-urinary tract infection. A transperitoneal approach was used and a large polycystic kidney was found on the left side with practically no kidney parenchyma. The liver, pancreas and right kidney were examined and no cyst was found, so the left cystic kidney was removed, which was about the size of a gallon bucket. Dr. Paul Kimmelstiel, the pathologist, made a diagnosis of polycystic disease of the kidney.

Dr. S. Joseph Pearlman, Miami Beach, Fla.—In answer to the question as to the incidence of calculi with polycystic kidney disease, I suspect that this complication is not uncommon. We have been very reluctant to advise operations for such cases, unless the calculi pass down into the ureters, causing acute renal blockages.

I can recall a case of polycystic disease, seen in 1920 with gross hematuria. The patient has exhibited intermittent hematuria for a period of 32 years, during which time he developed bilateral staghorn calculi. No attempt was made to remove them surgically, since they did not occasion any discomfort.

In 1946 he was subjected to a resection of the rectosigmoid for carcinoma and was wearing a colostomy cup. He died several weeks ago, 32 years after the onset of hematuria.

Dr. Anthony A. Borski, Washington, D. C.—I do not know the incidence of calculi in polycystic disease.

However, we operated upon a 25-year-old man with bilateral polycystic disease two months ago, who had several calculi in the cyst of one kidney; none was noted in the other kidney which was operated upon two weeks following the first operation.

Dr. Dougherty (closing).—The incidence of stone formation with polycystic disease in my hands has been uncommon.

The incidence of unilateral disease I believe, as we all know, places a burden of proof on the investigator because many of us have seen instances where there would be many cysts of one kidney and no cysts of the opposite kidney on gross observation, but close study would show one or two small cysts. This, of course, then would place it in the category of bilateral cystic disease and would fill the criteria for the diagnosis of polycystic disease. In one of the cases which I have presented, there was a large cystic kidney and on the other side a kidney presenting a hypernephroma with a very small cyst situated near it. Under the circumstances this would be, strictly speaking, a case of polycystic disease but the text-book picture would not be completely represented as we usually expect it. When the question arises at the time of operation where one kidney is being explored and one wishes to decide whether there are the factors substantiating the possibility of polycystic disease careful palpation of the opposite kidney would certainly be in order, but even here this might not detect a few cysts which could exist on the posterior surface of the opposite kidney. When we find multiple cysts of one kidney there is the strong probability that the other kidney is cystic also to a greater or less degree. It is reasonable to assume, I believe, if one kidney showed multiple cysts and advanced destruction by compression, that the opposite kidney might have relatively fewer cysts and under such circumstances the patient be able to carry on for a much longer period of time than if both kidneys were equally cystic.

CONTINUOUS ENTERAL FEEDING AND ITS IMPORTANCE IN PROTEIN METABOLISM OF THE SICK*

By JOHN ELLIOTT, Sc.D.
JAMES J. GRIFFITTS, M.D.
DONALD W. SMITH, M.D.
GEO. T. LEWIS, Ph.D.
and
PATRICK V. FERRO, B.S.
Miami, Florida

It is universally accepted that requirements for protein and other dietary constituents in sickness are greater than in health. Methods of maintaining or restoring normal nutrition in the sick are often inadequate since complications, weight loss and prolonged convalescence due in part at least to inadequate nutrition, are common to many illnesses.[1] A continuous feeding regimen and its successful application in the nutritional management of diseased individuals has been reported.[2] The continuing use of this regimen has disclosed certain features of feeding the sick which require a reexamination of principles of metabolism and which has led to a theoretical concept of feeding which is described herein.

A brief review of the salient features of adequate nutrition is necessary to emphasize the advantages of continuously feeding the sick patient. Normal nutrition may be defined as a state which permits the normal functioning of the body with maintenance of, or normal increase in, body weight. Normal nutrition depends upon the intake and utilization of adequate amounts of calories, protein, minerals, vitamins and water.

The human body is provided with mechanisms for the storage of carbohydrates (as glycogen) and of fat, which supply energy- producing substances during fasting. These two reservoirs in the normal individual are constantly being drawn upon and replenished. The healthy individual with normal stores of fat and glycogen, may undergo caloric restriction within certain limits without serious threat to life.[3]

The human being is provided also with mechanisms to conserve and reutilize certain essential minerals when they are not provided by the diet.[4,5] The losses of minerals from the body are generally proportional to the dietary intake and the conservation of minerals in periods of dietary deprivation is an important protective mechanism. In illness, however, losses may be excessive and minerals must be replaced and maintained.

The vitamins necessary to health are needed in relatively small quantities and may be stored to a limited extent, as fat soluble and certain B complex vitamins.[1,6] Only after prolonged deprivation of vitamins will specific deficiencies in the health of the normal individual occur.

*Read in Section on Gastroenterology, Southern Medical Association, Forty-Fifth Annual Meeting, Dallas, Texas, November 5-8, 1951. Manuscript received for publication March 31, 1953.

*From the Medical Research Foundation of Dade County.

There are two important elements of the diet which should not be considered to be stored in the body in the same sense that carbohydrates and fat are stored. These are water and protein.

Water is constantly turned over in the body at a very rapid rate. While the kidneys provide mechanisms for the conservation of water there is too great a loss (especially in illness) to consider that the body has storage sources of water. The catabolism of carbohydrates and protein and to a lesser extent, fats, releases water for body use. However, the amount of water required to eliminate waste products of metabolism and the insensible losses from the lungs and the skin, is such that water must be provided almost constantly in order to maintain health.[7 8 9]

It is the protein component of the diet that has been most seriously neglected in the nutritional management of the sick. There is a misconception: that body proteins constitute a "reserve" supply in health which is drawn upon during an illness; that this "reserve" is adequate to supply the excessive demands for protein during illness; and that the body proteins may be restored rapidly during convalescence by the resumption of a normal dietary intake. On these false assumptions the sick patient is fed intermittently, by mouth, tube, or vein, large quantities of protein in the hope that the excesses will be accumulated for subsequent metabolic needs. This is not the case.

Thorough consideration of the functions of protein in body metabolism requires a complete review of physiology and biochemistry and is not within the scope of this presentation. It is sufficient to point out that the basic structure of all cells is protein, and that the elaborations by the cells of such anabolic products as enzymes, hormones, and antibodies, depend on an adequate protein supply.[1] Indeed, all of the metabolic functions of the body depend ultimately on the availability and utilization of protein. To consider protein only as a source of calories, or to consider that it is stored, is a grave error.

The basic elements of the diet are not independent of one another. In order to prevent the conversion of dietary proteins to fill caloric requirements, adequate calories must be provided in the form of carbohydrates or fats; for example, recall the protein-sparing action of carbohydrates.[10] It has been established that minerals, vitamins or water must be provided in order for the normal state to be maintained in spite of the intake of adequate protein and calories. Protein, in many respects the most important and the least understood of the dietary components, will be discussed separately. It is necessary to keep in mind however that the other elements of the diet must be provided along with sufficient protein to maintain or restore nutrition.

AMINO ACID REQUIREMENTS IN HEALTH

The normal individual is able to maintain nutrition by ingesting the proper foods intermittently. The calorie-producing elements of the diet when taken in excess are stored as fat and glycogen in the body. When there is a need for calories for energy, fat and glycogen are converted to substances which are utilized in metabolism.

The requirements for protein are met in an altogether different way. When metabolism demands amino acids and the requirements are not met from the diet ingested, the body proteins contained in plasma and tissue fluid must be hydrolyzed to supply the needed amino acids. This breakdown and synthesis of body protein is a continuous normal process.[11] The cells of the body accept amino acids and build needed protein molecules. New protein molecules are made at the expense of already existing protein molecules unless a dietary source of amino acids is constantly available for synthesis. It has been demonstrated that all essential amino acids must be present nearly simultaneously if synthesis is to be accomplished.[12 13] The completeness of the amino acid composition of food and the time of its availability are all important in protein anabolism.

Figure 1 is a schematic presentation of the amino acid requirements of the normal individual and the effect of normal meals in meeting these requirements. The amino acid requirements of the normal individual vary with physical activity, being considerably lower at rest and while sleeping than during the active portion of the day. Amino acids derived from dietary protein are made avail-

able at different rates for protein[14] anabolism and probably remain available for two to six hours following the meal, their persistence in the circulation being dependent upon the amount and quality of protein ingested. As shown in this diagram the amino acid requirements of an active individual are met by dietary amino acids for most of the period while the individual is active. During the long fasting period of sleep, the demands of the body for amino acids are low and are met by hydrolysis of protein from tissue fluid and plasma.

Amino acids ingested in excess above the immediate requirements for protein synthesis do not, except in small amounts, become reserve protein supplies; they are not incorporated into protein molecules. If they are not utilized in the synthesis of body protein, the amino acids are deaminated; the nonnitrogenous portion furnishes a part of the caloric requirements of the body while the amino groups are converted principally into urea and excreted.

INADEQUACY OF INTERMITTENT FEEDING IN DISEASE

It is well recognized that the need for amino acids is increased in the sick patient. As is shown schematically in *Figure 2*, the increased demands of illness are continuous, day and night, in contrast to the lowered metabolic requirements of the healthy individual during rest. In order to recover from disease there is an increased demand for new cells, as leukocytes; for fibrinogen and other protein substances to promote the healing of wounds and the formation of exudates; for antibodies to combat infections; for enzymes and hormones to maintain excess metabolic activities; and for hemoglobin to maintain the oxygen-carrying capacity of the blood. Amino acids as the building blocks from which these products are formed are a basic and continuing requirement for the restoration of health.

Anorexia is a common symptom of illness and in spite of increased need (shown in *Figure 2* to be equal to that of a physically active normal individual) the sick patient is unable to ingest adequate amounts of food. Whatever he may be able to eat often does not even at its peak, meet the increased amino acid requirement. Food taken intermittently further fails to provide the continuous supply of amino acids required by the sick patient if he is to combat his illness successfully.

Malnutrition, the most frequent complication of illness, results from inadequate intake of food (and particularly amino acids) necessitating the breakdown of body proteins to supply the amino acids for reparative processes. In the starved patient, digestive processes may be impaired so that food eaten may not be digested or assimilated. For example, diarrhea in starvation is common and may be considered a sign of protein depletion.[16] Inadequate intake of food, and particularly protein, reduces the possibility of rapid recovery because each body protein molecule hydrolyzed to furnish the required amino

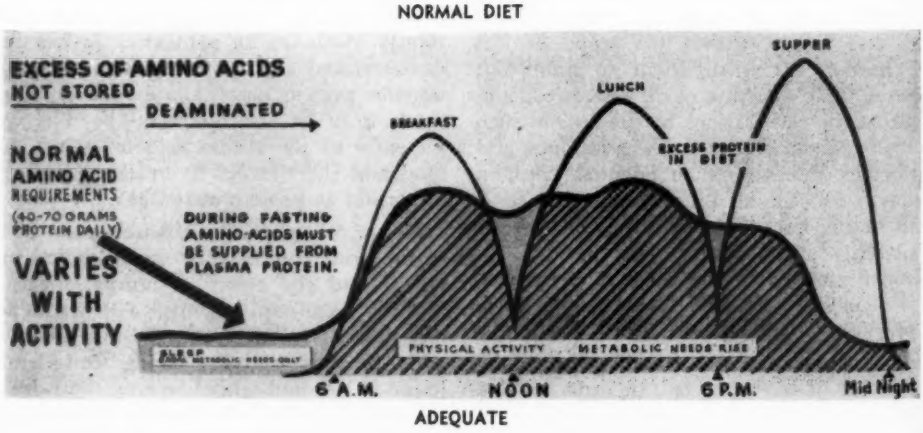


FIG. 1

Schematic Representation of Amino Acid Requirements in Health.

acids, must be replaced. Body protein can not be replenished unless dietary amino acids are made available at the time the demand for protein synthesis arises.

The development of amino acid solutions for intravenous administration was intended to supply the necessary excesses of amino acids for the management of the ill medical or surgical patient who could not ingest proper amounts of food. The limitations of their usefulness are now widely recognized.[17 18] The constant need for amino acids over long periods of time accounts for the inadequacy of parenteral feeding which must of necessity be given intermittently.

Since amino acids are not stored in the body, it is apparent that amino acids administered by vein are available only during the period of administration and perhaps for a short time thereafter. As shown in *Figure 2*, the utilization of intravenous amino acids (incorporation into protein molecules) is accomplished only during the time they are administered. When the parenterally administered amino acids are no longer available the protein needs of the body must be met by the hydrolysis of protein from tissue fluid and plasma. Intravenously administered amino acids are not capable of maintaining or restoring nutrition unless they are given throughout most of the period of increased demand; and unless they are administered along with adequate calories, minerals, vitamins and water. Thus far the attempts at continuous intravenous feeding have almost invariably been followed by venous thrombosis. This method for prolonged maintenance of nutrition is impractical.

DEVELOPMENT OF CONTINUOUS FEEDING REGIMEN

Tube feeding, as a method of providing the patient's entire food intake or as a supplement, has been practiced for many years. It is generally accepted that feeding by the gastrointestinal route is safer, more effective, and more economical than is parenteral administration. Difficulties associated with the commonly practiced tube feeding methods are: the time and effort of formula preparation; the intolerance of the patient for many feeding formulas; the susceptibility of feeding mixtures to contamination which necessitates refrigeration of the solutions; viscosity, necessitating a feeding tube of such size as to cause discomfort to the patient; the need to force thick mixtures through the tube by use of syringes and pumps. Many formulas have not been stable and when fed slowly, souring due to bacterial growth reduces the nutrient value of the solution and frequently causes nausea, vomiting or diarrhea. The most serious objection however, is the inability to feed such viscous, unstable preparations to the patient continuously through the long periods during which the increased demands of the sick patient persist.

Research at the Medical Research Foundation of Dade County, since 1947, has estab-

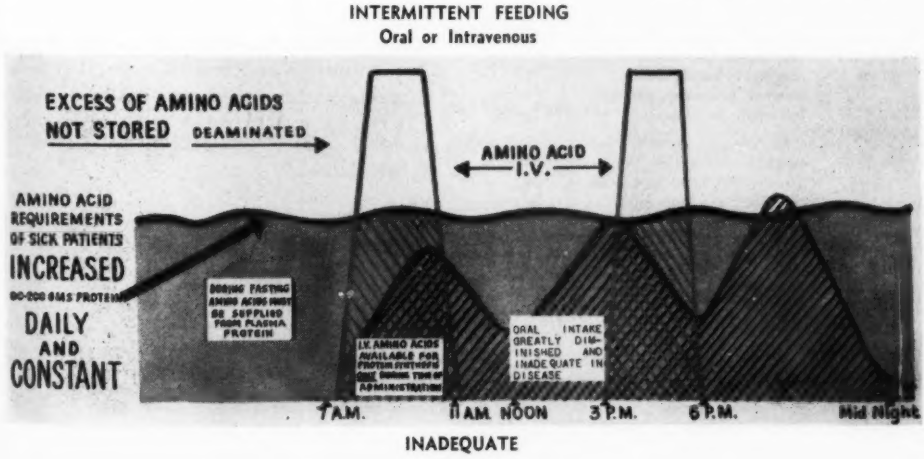


FIG. 2

Schematic Representation of Amino Acid Requirements in Disease. Intermittent Feeding.

lished the superiority of continuous drip feeding.[2] More than one thousand patients on the drip feeding regimen have provided evidence that the feedings are well tolerated and utilized more effectively than fractional feedings. *Table 1* illustrates the variety of conditions in which the regimen has been employed.

As a result of the need to feed continuously, a plastic feeding tube having an outside diameter of 2 mm. was developed. This tube is well tolerated by patients and is commonly left in place for several weeks without change. The tube is passed through the nose into the upper gastrointestinal tract and the free end is fixed to the skin of the face with adhesive tape. These tubes have also been employed in gastrostomy and jejunostomy feeding.

The continuous drip administration of solutions herein described assures tolerance and utilization by badly depleted and critically ill patients who usually need high protein, high caloric feeding the most, and tolerate it the least. The development of these solutions has resulted from the theory that the administration of nutrient solutions by slow and continuous drip, 24 hours a day, is the only method by which the amino acid requirements of the sick individual can be adequately met.

Many dietary formulas present difficulties in accomplishing prolonged slow administration because of contamination or viscosity, or toxic properties relating to their preparation which give rise to nausea, vomiting or diarrhea. If the solutions are to be properly used they must be stable, sterile, and resist bacterial contamination for the 8 to 24-hour periods during which they remain at room temperature at the patient's bedside. For this reason soluble products of enzymatic digestion of protein were selected which, with carbohydrates completely soluble in water, provide crystal clear solutions. The relatively nonviscous nature of such a solution simplifies the administration by continuous drip and eliminates the clogging of feeding tubes which complicates the use of more viscid "kitchen" formulas.

The nutrient solutions are rendered sterile by filtration and are delivered into sterile, sealed bottles. The elimination of heat sterilization results in solutions which are well tolerated by sick patients. Commonly available drip administration sets are employed to connect the nutrient solution in the bottle with the nasogastric tube in the patient. The rate of administration is controlled simply by the use of screw clamps on the tubing of the administration set. The solutions in sterile containers have been proven to be physically and nutritionally stable on storage over long periods of time at room temperature. Because of the simplicity of administration and the stability of the solutions, many patients have been fed in the home over prolonged periods.

The content of the feeding solution used during the past two years is shown in *Table 2*. Lactalbumin was selected since it has been

ANALYSIS OF 869 CASES ON ENTERAL FEEDING REGIMEN

Indications for feeding		No.	Average days fed
(1) Inability to eat	Mechanical and neurological—obstructive lesions of face, pharynx, esophagus, paralysis, hiccough, psychoses	114	29
	Coma—cerebro-vascular Accidents, head injuries, tumors, narcolepsy, eclampsia, poisoning, diabetes, encephalitis	173	14
(2) Excessive protein loss	Transudative, exudative, Suppurative, burns, hemorrhage, nephrosis, diarrhea, fistula	144	26
(3) Impaired protein synthesis	Hepatitis and cirrhosis	41	16
(4) Severe protein depletion (cachexia)	Pulmonary tuberculosis, senility, malignancy, heart disease, peptic ulcer, paraplegia	397	13
		869	14

TABLE 1

NUTRIENT SOLUTION FOR CONTINUOUS DRIP FEEDING FORMULA

	Per Liter
Protein (hydrolyzed lactalbumin)	65 grams
Carbohydrate (sucrose)	160 grams
Mineral	
Sodium*	1300 mg.
Potassium	700 mg.
Calcium	1200 mg.
Magnesium	170 mg.
Phosphorus	300 mg.
Iron	1.5 mg.
*For cardiac or edematous patients, low salt,	150 mg.
Calories per liter—Carbohydrate	640
Protein	260
	900

TABLE 2

established as an excellent source of all amino acids required for body metabolism. The soluble products of enzymatic digestion of lactalbumin are present in an amount equivalent to 65 grams of protein per liter. Calories are provided by protein plus sucrose (160 grams per liter) and a small amount of lactates. Adequate amounts of the essential minerals are present for the restoration or maintenance of physiological levels.

Detailed studies in selected patients fed from six to twenty-two months have indicated that fat is not essential for normal nutrition. The caloric value of the nutrient solutions when given in sufficient quantity has been proven adequate without the addition of fat. "Fat-free" nutrient solutions are better tolerated by sick patients, and by the omission of fat, crystal clear solutions proving absence of contamination, are assured.

The prolonged stability of complete vitamin mixtures added to this type of solution is not proven and, therefore, they are not included. The necessary intake of vitamins must be supplemented orally or through the tube in the amounts required by the patient.

ADEQUATE FEEDING BY CONTINUOUS DRIP

As shown schematically in *Figure 3*, by continuously providing amino acids in excess of the immediate requirements the depletion of body proteins characteristic of disease is prevented.

In contrast to intermittent feeding, orally or intravenously, there are no periods when the increased requirements of the sick patient must be provided from the proteins of plasma or tissue fluid alone. The continuous administration of adequate amounts of amino acids and calories together with the necessary minerals, vitamins and water, fulfills the time requirements for protein synthesis, that is, all essential amino acids are simultaneously available for anabolism.

The increased amino acid requirements in disease are present whether the patient is awake or asleep. These requirements can not be fully met except by feeding continuously, since amino acids are not stored nor do they remain except very temporarily, in the tissues, unless incorporated into protein molecules. The fact that metabolic requirements of disease are met by providing adequate dietary amino acids, enables the sick patient to restore body proteins formerly drawn upon, and at the same time providing raw materials for reparative processes which will bring about recovery from disease.

SUMMARY

The metabolism of the body is a continuous dynamic process; molecular complexes are constantly being synthesized and broken down. In the sick patient the requirements for the basic elements of the diet are increased and they continue day and night with slight variations due to activity. The body does not store protein and it is therefore necessary in the face of continuously increased amino acid requirements fully to meet these requirements day and night. Only in this way can reparative processes in illness be sustained without drawing on the essential proteins of the body's plasma and tissue.

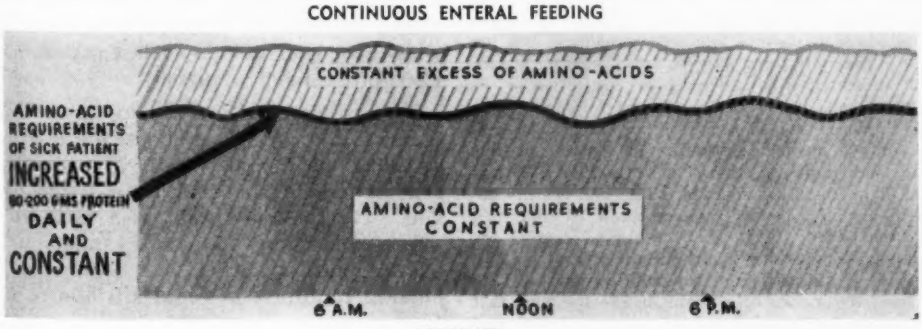


FIG. 3

Schematic Representation of Amino Acid Requirements in Disease. Continuous Feeding.

A feeding regimen is described which is well tolerated and which best meets the physiologic needs of the patient whose protein requirements are increased or whose protein stores are depleted. The formula utilized and the method of administration are presented and discussed.

REFERENCES

1. Pollack, H.; and Helpern, S. L.: Therapeutic Nutrition. Publication 234 National Academy of Sciences. National Research Council, Washington, D.C., 1952.
2. Elliott, J.; Smith, D. W.; Griffitts, J. J.; Lewis, Geo. T., and Ferro, P. V.: New Regimen in Feeding the Critically Ill (Preliminary Report). Arch. Surg., **64**: 278-285 (Mar.) 1952.
3. Taylor, H. L.; and Keys, A.: Adaptation to Caloric Restriction. Science, **112**:215, 1950.
4. Benedict, F. G.: A Study of Prolonged Fasting, Pub. No. 203, Carnegie Institute of Washington, 1915.
5. Sherman, H. C.: Chemistry of Food and Nutrition, 7th Edition, New York: The MacMillan Company, 1947.
6. Jolliffe, N.: Conditioned Malnutrition, J. A. M. A., **122**: 299, 1943.
7. Gamble, J. L.: Chemical Anatomy, Physiology and Pathology of Extracellular Fluid. Cambridge: Harvard University Press, 1947.
8. Darrow, D. C.; and Pratt, E. L.: Fluid Therapy, J. A. M. A., **143**:365-373, (May 27) 1950.
9. Peters, J. P.: Body Water. Springfield, Ill.: Charles C. Thomas, Publisher, 1935.
10. Albanese, A. A.; Irby, V.; Frankensten, L. O.: Effect of Carbohydrate Feeding on Urinary Output of Amino Acids and other Metabolites in Man. Federation Proc., **5**:118, 1936.
11. Schoenheimer, R.: The Dynamic State of Body Constituents. Cambridge: Harvard University Press, 1942.
12. Cannon, P. R.: Some Pathological Consequences of Protein and Amino Acid Deficiencies. Springfield, Ill.: Charles C. Thomas, Publisher, 1948.
13. Geiger, E.: The Role of the Time Factor in Protein Synthesis. Science, **111**:594, 1950.
14. Melnick, D.; Oser, B. L..; Weiss, S.: Role of Enzymic Digestion of Proteins as a Factor in Nutrition. Science, **103**:326, 1946.
15. Cannon, P. R.: Amino Acid Utilization in the Surgical Patient, J. A. M. A., **135**:1043-1046, (Dec. 20) 1947.
16. Mollison, P. L.: Observations of Cases of Starvation at Belsen. British Med. Journal, **1**:4, 1946.
17. Editorial: Some Current Problems in the Field of Parenteral Nutrition. Arch. Surg., **63**:139, 1951.
18. Ravdin, I. S.; Gimble, N. S.: Protein Metabolism in Surgical Patients, J. A. M. A., **144**:979 (Nov. 18) 1950.

DISCUSSION *(Abstract)*

Dr. Morton D. Pareira, St. Louis, Mo.—The urgent necessity of feeding patients who are malnourished, mechanically unable to eat or subject to prolonged acute illness is obvious and well recognized, but too little is generally being done to accomplish it. Parenteral alimentation is inadequate for restitution of the malnourished, or for total prolonged feeding. When it is employed, it is of utmost importance; but it is at best only a mediocre substitute for enteral feeding. Chronic malnutrition begets anorexia. At a certain level of malnutrition appetite is lost, and the psychological barrier to eating imposed when all concerned urge the patient to eat, does nothing to improve the situation. In tube feeding the malnourished patient, we have found that initial administration must be by slow, continuous drip. Well before the time that the patient has regained normal weight and a normal serum protein level, and while there is still marked nitrogen retention, appetite returns with gusto. Some of our patients have voluntarily eaten over 3500 calories daily at this point even though they were completely sedentary. One must guide the patient's diet at this point, since while it is quantitatively normal it may be qualitatively pathologic. It is in such patients, and in those acutely ill medical and surgical patients in whom parenteral alimentation falls dangerously short of the dietary need, that tube feeding plays a tremendously important role. The use of the small polyvinyl tube, and of feeding mixtures fulfilling the criteria described by Dr. Elliott make tube feeding a most practical and well tolerated method of artificial feeding. Experiences of World War II nutrition teams with tube feeding indicate that the intestinal tract of patients almost moribund of starvation will digest and absorb. We have additionally found, in experiments to be reported, that the intestinal tract of postoperative patients will efficiently digest and absorb whenever peristalsis is present. With the refined methods of application available and the experiences now accumulating, tube feeding will surely assume an eminent position in artificial feeding programs. Time prevents presentation of data, so I can say only that our experiences coincide with those of the essayist.

THE USE OF OPIATES IN CHRONIC ILLNESS*

By REX BLANKINSHIP, M.D.

and

THOMAS F. COATES, JR., M.D.

Richmond, Virginia

During recent years much attention has been paid to problems of addiction. Medical and lay journals have pointed out the dangers of careless and indiscriminate use of opiates and barbiturates. The likelihood of addiction when these drugs are given to neurotics is well-known. Surgeons seek to prevent postoperative addiction. In short, physicians generally have been alerted against the more obvious problems of addiction.

This paper is an attempt to express some of our feelings and ideas about, and is written on behalf of, the chronically ill patient, the type of patient about whom it is too often said, "He can't get well; give him all he wants," and later, "I know he's unhappy taking so much medicine, but because of his physical condition it would kill him to take

*Read in Section on Neurology and Psychiatry, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

him off drugs." These are the addicts who are not usually classified in our minds with the typical psychopathic type of addict. These unfortunate ones have been given opiates or continued on opiates by honest, conscientious, capable physicians motivated by the sincere belief that their action is for the best interest of their patients. These are the persons to whom the law allows us to give as much of any or all narcotic drugs as we think necessary.

Drug addiction has been defined as a state in which a person has lost the power of self-control in regard to his use of a drug to the extent that he himself or society suffers. Three basic criteria for addiction, (1) tolerance, (2) physical dependence, (3) habituation, have been described by Himmelsbach and Small.[1] In this country opium derivatives, certain synthetic morphine-like drugs (demerol,® hydrochloride, methadone, etc.), cocaine and marihuana are controlled by the Harrison narcotic act. Vogel, Isbell and Chapman[2] include as addicting barbiturates, bromides, alcohol, peyote and amphetamine.

In this paper we have limited ourselves to a discussion of a group of patients addicted to opium derivatives. However, our remarks could well be applied to all the drugs just mentioned. The symptoms and results of opiate addiction are well-known, and need be mentioned here only briefly. Among the more distressing are the loss of independence, loss of interest in friends, family and work, the slave-like dependence on the drug, deterioration of character and physical decline.

A review of the records of the last thirty-five patients admitted to one of the sections of the women's department of Westbrook Sanatorium for opiate addiction shows that fifteen (approximately 41 per cent) were suffering from various chronic illnesses which either had been diagnosed as chronic or apparently could have been so diagnosed at the time that the use of the drug was begun. In all of these cases the drug was prescribed and its use continued by physicians for long periods of time. For our purpose we have here used the term chronic illness to include only chronic physical illnesses of the type which usually are considered to produce pain or discomfort and which are either incurable or may be expected to last indefinitely. Furthermore, we do not include such diseases as incurable malignancy in which suffering and death within a reasonably short time are inevitable. Patients in this category certainly deserve any type of relief that can be given to them. Among these fifteen cases were patients with colitis, peptic ulcer, hypertrophic arthritis, arteriosclerotic heart disease, sciatica, sinusitis, migraine, coronary occlusion, and so on. The drugs used by these patients were either morphine, dilaudid,® pantopon® or demerol® or combinations of these drugs.

For purposes of illustration a case summary is presented.

The patient, a 75-year-old widow of five years, was admitted to the hospital as a transfer from a general hospital where she had been hospitalized for several weeks for treatment of morphine addiction and study of her physical condition. While there she was studied by a competent internist who diagnosed (1) arteriosclerotic cardiovascular disease, (2) hypertrophic arthritis, mild to moderate, (3) aortic aneurysm. It was recommended, in view of her physical condition and age, that her dosage of morphine be reduced to grain ¼ every 4 hours, and that she be transferred to a sanatorium for the duration of her life and kept on morphine in the dosage just mentioned. Her past history revealed that she had always been an emotionally unstable, hot-tempered, often unreasonable, domineering person, who hated pain and would go to any lengths to have her own way. Her family doctor gave her morphine to relieve her discomfort following childbirth (at about age 35) and continued it when she complained of arthritic pains in the hands and elsewhere. During her husband's life, due to his constant support, she was able to stay at home, but after his death the use of the drug rapidly got out of hand and she was finally hospitalized. As far as we can determine no one during all these years ever considered the possibility that morphine was not necessary for her.

On admission to Westbrook her gait was unsteady, she was partially disoriented and she misidentified people. She was careless about her personal appearance and needed help to dress herself. She was irritable, demanding, abusive and totally lacking in insight. She complained bitterly of pain, constantly demanded hypodermics, and having received a hypodermic would promptly forget about it and deny having had it, sometimes before the nurse could get out of the room with the empty syringe. Marked impairment of recent memory was noted. She was so weak that she could not go up and down stairs without assistance. At this stage she had been stabilized on the recommended dosage of morphine sulfate grains ¼ q. 4 hours for several weeks. After two

months without change, gradual withdrawal of morphine was begun. Because of her hostile attitude and lack of insight she was not told that the drug was being withdrawn until she had been completely off of morphine for some time, and we began to decrease the number of hypodermics. Up to that point she had not been aware of any change. During the period of withdrawal she was given vitamin B_{12}, 50 mic. daily, mephenesin, grams 2 daily q.i.d., p.c. and h.s. Following withdrawal she remained reasonably contented and free from pain on one vitamin injection daily and aspirin, grains 5 three times a day, p.r.n. for pain. These medications were given as a concession to her need for the comfort she derived from taking medicine and "being stuck," since we considered it impractical to attempt to break such long-standing behavior patterns in a person of her age and personality.

During the withdrawal period and following it gradual but dramatic changes occurred in this patient. She became much more friendly, sociable, cheerful and interested in others. She gained strength rapidly and her appetite and sleeping habits improved. Her complaints of pain diminished markedly and her memory improved. She played bridge, ping-pong, croquet, shuffleboard, and had to be stopped from playing badminton.

We believe this woman has been happier, healthier, more comfortable and has functioned more efficiently without morphine.

Another case well-known to one of us (T.F.C.) and not included in the above series is that of a 67-year-old divorced woman who became addicted to dilaudid® hydrochloride two years after her first coronary occlusion which occurred at age 62. Prior to her illness she had always been extremely conscientious about not taking medicine, always professing abhorrence of sedatives and "dope" in any form and even refusing aspirin on the grounds that it was injurious to the heart. Moreover, she was known by her family, friends and family physician to be a highly intelligent but erratic person, impractical, fearful and over-anxious about matters of health, suggestible, given to sudden enthusiasm, lacking in sustained drive, and overly dependent on her children. In addition she had frequent mild mood swings and often had to be reassured and comforted.

At the time of her first occlusion and her second which occurred six months later, she was given dilaudid® hydrochloride for pain. At that time she was much impressed by the feeling of comfort and "heavenly peace" that it gave her. Her physician assured her that the medicine would not hurt her and that she could have it whenever she had pain.

Following her second occlusion she developed heart failure and has since required diuretics regularly. She also complained often of an anginal type of pain for which dilaudid® hydrochloride, grain 1/32, was given on rare occasions (three or four times a year). During this period her physician suggested whiskey in small doses for relief of anginal pain. Within two weeks she was taking drinks almost every hour. Accordingly, this was discontinued.

Two years after the onset of her illness she moved to another city and changed physicians. The new doctor soon told the family that she had very little time to live and taught her to give herself hypodermics in order that she might be less fearful, more independent and could get out more without so much fear of having a "heart attack" without some one to help her. This plan worked well for a short time. Then she inevitably began to take hypodermics to "ward off" heart attacks. The episodes of pain increased in frequency, her physical condition deteriorated, she lost interest in family and friends, became weak, helpless, depressed. For almost two years her family and her physician attributed all these changes to her heart disease and maintained that the opiate was essential for her and that any attempt to hospitalize her and withdraw the drug would kill her. Finally after she remained semi-stuporous for days, during which time she had a bad fall, she was hospitalized and the dilaudid® hydrochloride as well as chloral hydrate which had been added were withdrawn in ten days without complications. Since then (three months) her physical condition has improved a great deal, she is much more active (walking five to six blocks without difficulty), she sleeps well without sedatives, helps with the housework, seldom has anginal pain, but when she does it is controlled by nitroglycerine and reassurance, and her friends say she is "like her old self."

This patient, too, we believe, is happier, more comfortable and better able to enjoy her remaining years without the use of an opiate.

Relief of severe pain is generally considered to be the primary justifiable indication for the use of opiates. Like Vogel, Isbell and Chapman,[2] we believe that of the three factors in analgesia described by Wolff[3] and his coworkers: (1) elevation of the pain threshold; (2) alteration of the emotional reaction to pain; (3) production of sedation and sleep; the second is the most important. Also it seems that certain individuals learn, all too quickly, that the opiate alters their emotional reaction to other painful things, moods, feelings, thoughts. For our group it seems to make it easier to meet the problems posed by the illness itself and the pain.

Our experience in a private psychiatric hospital indicates that a significant percentage of the addicts that we see are persons with chronic physical disorders usually causing pain and that many of them were given opiates under conditions which might ordinarily seem to justify its use.

The general contraindications for the use of opiates have been clearly pointed out by others. Jeghers and Brick[4] have discussed

and listed eleven physical illnesses in which morphine is contraindicated from the physical standpoint. Everyone knows that opiates should not be given for alcoholism or to psychoneurotics or for the purpose of allaying anxiety (except as pre-anesthetic medication). Furthermore, in order to avoid such problems as we have discussed, it seems that before prescribing opiates the physician should ask himself certain questions, such as: is an opiate really necessary? Is the pain or the reaction to the pain exaggerated? Are there factors other than pain disturbing the patient? Will some other form of treatment work as well or better? Is this a chronic condition to which the patient will have to learn to adjust himself? Are there factors in his personality and background that would indicate that he is neurotic, emotionally unstable or immature? Has he reacted poorly to pain in the past? Is he unable to accept his illness in a reasonable way? Is he unable to tolerate frustration? Has he had a mental or emotional illness? Has he previously had trouble with drugs or alcohol? If these questions receive more than a few affirmative replies, opiates should not be used or if used should be given sparingly and with extreme caution.

With our present understanding of personality and interpersonal relationships, our increased supply and variety of other more innocuous drugs, our antibiotics and so on, for specific treatment, and our improved surgical technics, much more can be accomplished in the treatment of chronic illnesses without the defeatist attitude of "make him comfortable, we can't do anything else" than was formerly thought possible.

The physician must consider each patient as an individual, seeking to understand how he feels, how he thinks, what he expects, how his illness affects his life, how it affects his family, his work, his friends; and he must try to understand the part that pain plays in all these things. Then he can effectively aid the patient in the numerous adjustments that he must make in the process of re-learning the art of living despite the handicap of illness and pain.

As for those patients who fall into this category and are already addicted, we believe that they, too, can be helped. Almost all of these patients if truly addicted can and should have the drug withdrawn. Where this has been done we have seen no patient who was not improved. This point is made because such patients are often referred to the hospital with the request that the drug be reduced but not t a k e n away completely because "she couldn't stand complete withdrawal; it might kill her." On the contrary, the patient's life is much more apt to be shortened by continued addiction.

Our experience has been that withdrawal of the drug cannot be accomplished satisfactorily outside of a psychiatric hospital or a general hospital with a psychiatric department. The average period of hospitalization for an addict in our hospital is from six to eight weeks, though we consider four to six months preferable. The average period of withdrawal is from fourteen to twenty-one days. During the remainder of the time efforts are made to help the patient to become stabilized, to show him how he can handle his pain and his other problems without resorting to narcotics. Attempts are made to help him to solve or to accept any personal problems, family problems or occupational problems that may exist. Much time is spent with relatives of the patient with whom he is to live when he goes home. The success of the treatment may depend upon their understanding and cooperation. One major hurdle to overcome in treating this group of addicts is their belief that they are justified in taking narcotics because of their illness. Usually no amount of persuasion will convince them of the fallacy of this belief until after it is demonstrated to them that they are better without drugs and can get along without them. Continued firmness, kindness and understanding on the part of the family and family physician during the months subsequent to hospitalization are essential to the successful handling of these patients. Therefore, it is highly necessary that the family physician keep in mind that any patient who can get along reasonably comfortably without narcotics in the hospital can do the same thing at home.

SUMMARY

Although great strides have been made in the control of narcotic addiction during recent years, there is still a tendency among phy-

sicians to regard the use of narcotics as not only justifiable but necessary in handling certain chronic illnesses. In such cases where pain is constant or recurrent, addiction is apt to occur, thus adding another serious problem to that already existing.

Approximately 41 per cent of the last thirty-five addicted patients admitted to one section of a private hospital fell into this group. Two illustrative case summaries have been given. Both demonstrate that although opiate seemed essential the drug could safely be withdrawn and the patients were able to function much more comfortably and effectively without it.

Study of these patients indicates that all of them possess certain personality traits that might have been taken as warning signals of the likelihood of addiction. Some of these traits have been enumerated, namely: exaggeration of pain, presence of other disturbing problems, presence of known neurotic symptoms, tendency to over-react, previous addiction, and so on.

A brief discussion of the treatment is given, emphasizing the importance of re-orientation of the family as well as the re-orientation and re-education of the patient. For this problem, to be trite, "An ounce of prevention is worth a pound of cure," but the pound of cure can be effective with the active support of the family and family physician.

REFERENCES

1. Himmelsbach, C. K.; and Small, L. F.: Clinical Studies of Drug Addiction: 11. "Rossium" Treatment of Drug Addiction, with a Report on the Chemistry of "Rossium." p. 1. Supplement 125 to the Public Health Reports. United States Treasury Department, Public Health Service, 1937.
2. Vogel, V. H.; Isbell, H.; and Chapman, K. H.: Present Status of Narcotic Addiction. J.A.M.A. **138**: No. 14 (Dec. 4) 1948.
3. Wolff, H. G.; Hardy, J. D.; and Goodell, H.: Studies on Pain, Measurement of the Effect of Morphine, Codeine and other Opiates on the Pain Threshold and an Analysis of Their Relation to the Pain Experience, J. Clin. Investigation **19**: 659 (July) 1940.
4. Jeghers, H.; and Brick, I. B.: Hazards in the Therapeutic Use of Morphine, p. 1761. Medical Clinics of North America, 1950 (November).

DISCUSSION *(Abstract)*

Dr. Sullivan G. Bedell, Jacksonville, Fla.—It is rather alarming to consider the great frequency with which opiates and similar drugs are prescribed to relieve pain where addiction is inevitable. The authors have demonstrated that these same patients when relieved of their addiction have gotten along better without narcotics than with them.

THE DIFFERENTIATION AND MANAGEMENT OF ABNORMAL MENTAL STATES IN THE AGED*

By WARREN T. BROWN, M.D.†
and
JACKSON A. SMITH, M.D.‡
Houston, Texas

The common emotional problems encountered in aged people may, and usually do, result from more than one factor. The correlation of change in behavior and the development of alteration in structure concomitant with advancing age implies a cause-effect relationship. Too frequently, however, all of the changes in behavior observed in patients past fifty-five years of age are attributed to the structural changes in the central nervous system. The patient himself will often suggest this with some such comment as: "I guess, I'm just getting old," or "Do you think it's old age, doctor?"

As a person grows older provocative factors in his surrounding situation do not cease. Indeed, new and more serious ones may be induced by the attitude of society toward the fact that he is "getting old." He may become aware that there are younger and at least equally capable men waiting anxiously to replace him when he can no longer fill his job, or he may begin to view his company's age of retirement rule in a new and more threatening light.

Regardless of what pathological change may develop in the structure of the aging person, as long as he is conscious and able to experience his environment, emotional factors arising from his situation in life will play an important role in determining his behavior. Failure to recognize this tends toward neglect of therapeutic possibilities that otherwise might afford the patient more productive and happier years of life. An attitude of

*Read in Section on Neurology and Psychiatry, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

*From the Department of Psychiatry, Baylor University College of Medicine, Houston, Texas.

†Professor of Psychiatry and Chairman of Department of Psychiatry, Baylor University College of Medicine, Houston, Texas.

‡Assistant Professor of Psychiatry, Baylor University College of Medicine, Houston, Texas.

futility may result which will limit treatment to supplying the patient simple comfort and taking precautionary measures to prevent his annoying the family.

It is the responsibility of the physician, charged with the care of the person whose illness seems to be related to the aging process, to evaluate cautiously two interrelated factors. He should determine, as accurately as possible, how much loss of capacity the patient has suffered from the advancing pathological changes of senility. Next he must evaluate the element of emotional disturbance and its effect on the patient made thus vulnerable by senility. Persons with average tendencies towards depression or anxiety may, as they begin to age, more easily develop these conditions and more tenaciously cling to them. Attention to a patient's emotional and situational needs is more strongly indicated where a deficit in capacity has resulted from senile change.

Aging, itself, is an enormous change when viewed objectively. The complexity of changes it precipitates is staggering. The person changes with a resulting change in the attitude toward him of all persons around him. The change in attitude toward him provokes in him a changed attitude toward himself and others. He finds himself living in a new and strange situation at a time when his capacity for adjustment has been diminished and he no longer has the advantage of the flexibility of youth. Frustration results and it is frequently the response of an average older person to such frustration that is mistaken for evidence of deterioration and far greater change in the central nervous system than actually exists.

A careful differentiation between those features of abnormal mental states in aged people which arise from response to situational disturbance and those that result from morbid anatomy in the organism is essential to the best management of each patient.

There are many common problems which account for frustration in the aged with resultant emotional disturbances. Among these are: retirement enforced by company rules and giving no consideration to actual capacity to continue working; limited physical activity due to physiological deficit in a normally energetic person; reduced sexual activity in keeping with advancing age; loss of spouse necessitating gross change in way of living; reduced sense of responsibility or feeling of being needed; loss of, or assumed loss of, status or position in the community with resulting sense of injured dignity and probably commonest of all the fear of being a burden or a nuisance.

In the evaluation of mental illness in the aging or aged, it is essential to look for such contributing factors as those named above and to weigh their etiological importance. This implies a careful investigation into the personality of the patient in his younger premorbid state. A knowledge of what the patient attached great importance to or valued highly may reveal why certain losses are important in his frustration. A fundamentalist minister whose early life has been dedicated to a rigid denial of many human pleasures he has considered sinful may suffer seriously upon discovering that his own children, now grown, enjoy these very pleasures. A sportsman, whose greatest interest in life has been breeding hunting dogs may, in his later years, not be able to muster the emotional stamina necessary to maintain equanimity when he learns that his son has no love for dogs and plans to sell them all, clear out the kennels and put in a tennis court as soon as his father dies.

Case A.—Mrs. P. T., a 73-year-old widow was brought into a hospital irrational, disoriented, negativistic and depressed. Her mood fluctuated rapidly and her general behavior strongly suggested a senile psychosis of an irreversible type. It was learned that her husband had died 18 months prior to the admission and that for 30 years prior to his death she had devoted her life to keeping him alive in spite of advanced diabetes and serious cardio-vascular disease. She had been basically an extremely anxious and tense individual who "fought hard for what she believed in and for those she loved." After institutional rest and nutritional support failed to produce any improvement she was given electroshock therapy with misgivings and some apprehension on the part of the staff. Within 5 weeks she returned to her home greatly improved and 5 years later she was a happy leader in community activities in her own home town. Her friends remarked that she looked and behaved younger than she had 10 years before.

Case B.—Mr. J. T., a 76-year-old small town business man, who had been widowed by the death of his

wife three years before was induced to turn over the management of 2 farms to a younger man and move to the large and comfortable home of his daughter in the city, 200 miles away, where his daughter insisted "she could look after him."

Seven months later he was taken to the private psychiatric section of a general hospital because he had become threatening, irrascible and negativistic and been abusive toward his daughter, her husband and their children, and insisted that it was time they quit holding him a prisoner and let him go back to his home and his wife. The family reported that he had ceased to eat and paced the floor at night instead of sleeping and became even more disturbed when they had given him "sleeping pills." In the hospital, he was at first uncooperative, negativistic and negligent of his appearance and personal hygiene. He was given protective care and fortified nutritional support and was visited regularly by the psychiatrist, who allowed him to talk freely as long as he wished.

Initially his talk consisted of abuse of his family, the doctor, the hospital and everyone who was concerned about him. Later (apparently in response to the doctor's allowing him to express his desires without resisting them) he began to plan to return home and to his wife. When the doctor began to share in this planning he began to show improvement. After overcoming considerable resistance on the part of the family, particularly the daughter, an arrangement was made to let him try living in his old home town. The trial was accepted purely on a temporary basis, arrangements were made through a local older physician and former croney of the patient to have his nutritional and general physiological needs checked regularly and he took up living again "at home." Three years later he was still living happily at home, on the "temporary basis;" he still spoke of his wife as if she were living and expressed an occasional illogical idea. Nevertheless he had established a comfortable living routine of his own which was in keeping with his capacity and apparently free from the torment older people seem to experience from the feeling of being restricted by the very persons who are trying to give them loving care.

The treatment of emotional illness occurring in aged people with or without capacity deficit resulting from structural deterioration involves several important aspects. Most important of these is that the doctor remain ever mindful that even where undeniable evidence of pathological senile change is present there may be serious reversible emotional illness. Careful attention to the nutritional needs of the patient, particularly with regard to the protein and vitamin deficit is a must and the results of overcoming nutritional deficits are extremely rewarding in improvement of the patient and satisfaction for the physician. The reduction of irritability and restlessness with appropriately selected sedatives is extremely valuable. It is at the same time recognized that excessive use of certain sedatives can be one of the complicating problems in the care of aged people. In our experience the use of mebaral® supplies a maximum of relaxation and freedom from restlessness and irritability with a minimum of danger of complications. In those instances where the depressive features of the illness occurring in the older patients are determined to be a result of a definite depressive illness, electroshock treatment is appropriate. Electroshock therapy, however, should be used only after careful diagnostic observation as in some illnesses it appears to increase the seriousness of symptoms arising out of structural change resulting from senility.

Metrazol® orally has been reported as an effective adjunct in the case of the aged by Chesrow, *et alii*.[1] The recommended dosage is from 1 to 4 tablets four times a day; the tablets contain 1½ grains of metrazol.® The only untoward effects reported were nausea and vomiting which were relieved by reducing the dosage.

Above all other therapeutic measures in importance, is an understanding psychotherapeutic approach to the patient which takes into consideration, first, the basic personality of the individual, second, the evaluated deficit which has resulted from age, and third, the situation in which the individual is living and his response to it.

In summary, the occurrence of peculiar or disturbing behavior in patients in the older age groups does not necessarily imply senile dementia. It is important to evaluate the situational factors in the patient's environment which may be provocative and to evaluate the patient's emotional response to such factors. Where management under home conditions is not feasible, diagnostic observation under hospital conditions is advisable before specific physiologic therapeutic measures are applied.

REFERENCE

1. Chesrow, E. J.; Giacobe, A. J.; and Wosika, P. H.: Metrazol in Arteriosclerosis Associated with Senility. Geriatrics, 6:319-323 (Sept.-Oct.) 1951.

PHYSICAL MEDICINE AND REHABILITATION AS APPLIED TO GERIATRICS*

By A. B. C. KNUDSON, M.D., F.A.C.P.†
Washington, District of Columbia

It has become firmly established that the specialty of physical medicine and rehabilitation provides needed and valuable consultation service to all other medical specialties in the total team approach toward rehabilitation of the whole man. However, in a broader sense, there are three large and important areas where this specialty can make the greatest contribution, namely: the treatment, rehabilitation and readjustment of the severely disabled, the chronically ill, and the aging. It is the purpose of this paper to emphasize the last of these, and to discuss that phase of physical medicine and rehabilitation otherwise frequently referred to as "geriatric rehabilitation."

The facts and statistics pertaining to the increasing longevity of our population are well known. We are all aware that increasing age also increases the possibility of multiple pathological processes in the individual, with associated difficulties in management and treatment. The resulting medical, economic, psychological and social problems presented by the elderly are demanding more and more attention throughout the country.

The field of geriatric rehabilitation is of intense interest to physicians in private practice just as it is to us in the Veterans Administration. The geriatric problem before us today is of such significance that it appalls the imagination. To make every older man and woman capable within his physical and mental limitations of being useful to himself and to society is a challenge which is being discussed more and more by the medical profession. Indeed, it has become a national challenge! For example, an industrial executive at 64 years and 364 days is carrying an immense responsibility; and the next day at 65 he is too old! The idea of arbitrary retirement based on chronological age is a physiological absurdity!

Aging is a gradual change and is never abrupt. This growing interest in geriatric problems is stimulated by the fact that we are becoming a nation of middle aged and elderly persons, and that, if this trend continues, about 50 per cent of our total population will be over 45 years of age by 1980. In 1920 there were 5 million persons over 65, which is the usual dividing line between young and old; there were 11 million persons over 65 in 1948; and it is estimated that by 1975 there will be 18 million persons over the age of 65.

As physiatrists, where is the challenge for us in this outlook? Briefly this, that directly related to increased age in the human is the greater incidence of chronic illness, disability, degenerative diseases, and physical and mental impairment. Progressive deterioration is inevitable in most instances. Chronic disease and severe disability increase in direct proportion to the age of the individual; along with this there is a feeling of frustration and futility on the part of the older patient. Even the physician often has an attitude of hopelessness in considering the prognosis for him. This entire concept must and can be changed! Just as physical medicine and rehabilitation serves all of the specialized fields of medicine, likewise it can make one of the greatest contributions in the field of geriatric rehabilitation. The application of physical medicine and rehabilitation principles and procedures for the prevention, diagnosis, treatment and rehabilitation of geriatric illness and disability opens a field of opportunity unequalled in the realm of medical practice.

Aging may be considered as that larger component which frequently includes concomitant chronic illness and severe disability. These may exist in the same patient at the same time and in any number, combination or degree of severity. Aging would appear to be that catalyst which effectively brings about a reaction of hopelessness; the net result is one of absent or at most, passive action in the direction of rehabilitating and readjusting the patient. On the other hand, the existence of age alone is frequently the major cause of disablement of the individual both to himself and to society. Psychological difficulties of the aging person may be seriously disabling.

---

*Read in Section on Physical Medicine and Rehabilitation, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

*Published with the approval of the Chief Medical Director. The statements and conclusions published by the author are the result of his own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

†Chief, Physical Medicine and Rehabilitation Division, Veterans Administration, Central Office, Washington, D. C.

The further insults of forced retirement and the feeling of uselessness cause increased deconditioning and demoralization.

The basic needs in this field can be met only with a dynamic therapeutic regimen. The conditions which afflict aging patients offer especially favorable opportunities for the application of physical medicine and rehabilitation methods. We in the Veterans Administration have given a great deal of attention to the matter of medical care and dynamic rehabilitation for aging veterans. We have a comprehensive and well integrated physical medicine and rehabilitation service which, through a team approach and positive application, is accomplishing worthwhile results. The average World War I veteran is now about 59 years of age, and the average World War II veteran is over 34 years of age. In the next ten to fifteen years, veterans as a whole will constitute an age group which will demand special measures if they are to live useful lives. The 19,288,000 veterans of this country are a significant part of the entire population. Rusk has said that both the Veterans Administration and some civilian hospitals have demonstrated that rehabilitation to the point of self-care, and even to full or limited employment, is possible for many of these patients. Yet in many of our civilian hospitals the patient receives no such services. Many hospitals complain that the aged and chronically ill are responsible for their crowding, yet they do little to provide these patients with the geriatric rehabilitation services that will permit them to leave the hospital and return to their communities. If we rehabilitate these patients to the physical demands of daily life they will leave the hospital.

Stieglitz[1] observed,

"Any effective program, therefore, toward the prevention of premature disability or partial rehabilitation must include the provision of utilization of the partially handicapped, whether the disability be due to age alone, chronic illness, or any other impairment. A place in society where one can be useful is prerequisite to success in any rehabilitation program. If there is no purpose in improving health there will be no effort made."

The aging of our population has been a matter of increasing interest to medicine in recent years. The proportion of persons 65 years and older has jumped from 4.1 to 6.8 per cent between 1900 and 1940, and it is estimated that it will exceed 13 per cent before the end of the present century. Thus this must become an important consideration in our medical thinking and planning. We, as physiatrists, must meet this challenge. We must take advantage of this great opportunity for substantial accomplishment! By adequate and proper utilization of physical medicine and rehabilitation procedures we shall not only add years to the expectancy of life, but also increase the productive capacity of the country as a whole.

The Veterans Administration believes in the dynamic rehabilitation of the aged, chronically ill, or severely disabled veteran, and in his effective employment following his restoration to usefulness. This is truly dynamic effectiveness and constitutes reconstructive medicine at its best!

In order for the Veterans Administration to carry out its obligation in the treatment and rehabilitation of veterans, the Department of Medicine and Surgery was established by Congress following World War II. A physical medicine and rehabilitation service was organized as a major service in each hospital and as a medical unit in each regional office clinic. The basic organizational pattern was developed at that time under the leadership of Dr. Donald A. Covalt and with the consultant advice of Dr. Howard A. Rusk. Later Dr. A. Ray Dawson further strengthened this concept. It is interesting to observe that this same pattern exists today as the most effective one for accomplishing complete rehabilitation in the shortest possible time and with the least possibility of necessity for the veteran to be readmitted for further or renewed rehabilitation procedures. Various changes in this pattern have been tried, but were proven ineffective, and we firmly believe that the present organization is the most useful and efficient.

The chief of this service is a physician, preferably a board diplomate in physical medicine and rehabilitation. Whether or not he may have an assistant chief, also a physician, and additional staff physiatrists, he has an executive assistant in the larger hospitals, who is responsible for coordination of rehabilitation activities and for medical administration. There are five component sections of the service, namely: physical therapy, corrective therapy, occupational therapy, educational therapy and manual arts therapy. Each section

has a chief and the necessary number of staff therapists. In many installations there is also an audiology and speech correction section, and a blind rehabilitation section. Each section chief is responsible directly to the physician for all clinical and treatment matters, and to the physician through the executive assistant for those items concerning administration and coordination.

After the experience of the Veterans Administration during the past seven years, it has been proven that physical medicine and rehabilitation pays off economically. We have been able to show that effective administration and dynamic operation of this service are not only medically necessary, but economically sound, in a total program, and it has actually saved hundreds of thousands of dollars for the country.

A significant share of these favorable results has been due to the inauguration and operation of physical medicine and rehabilitation bed services in a large number of our hospitals during the past three and one-half years. This plan was initiated early in 1949 upon the recommendation of Dr. Howard A. Rusk, at that time a member of the council of chief consultants to the chief medical director. At present there are over 1400 beds which are the exclusive responsibility of the physiatrist. The remarkable results achieved by this system at many of our hospitals have been previously reported, for example, to name a few: the hospitals at Bronx, New York; Wood, Wisconsin; Houston, Texas; and Ft. Howard, Maryland. The third annual report of this bed service at Ft. Howard, Maryland, was received a short time ago. At that hospital three years of effective operation of such a bed service have been completed. It has been found consistently each year that less than 5 per cent of aged, chronically ill and severely disabled veterans who have been rehabilitated and discharged seek readmission. Usually such readmissions, when they occur, are actually for some other medical or surgical condition which has developed.

The physical medicine and rehabilitation service of the general medical and surgical hospital, Veterans Administration Center, Los Angeles, California, has published a 20-page report[2] entitled, "It Pays to Rehabilitate," which bears out the statements made above. The results show that

"Physical medicine and rehabilitation services are effective in improving the health of the disabled individual and in restoring him to a more comfortable and useful life; that a saving in dollars and cents can be effected through development of the self-care potentials of disabled persons with a resultant reduction in the cost of hospital care."

This study is based upon careful and complete classification of detailed data on all patients referred to the physical medicine and rehabilitation service; complete records were maintained on all patients.

From a total number of several hundred patients treated by this service during 1949 and 1950, a group of 105 was selected for scientific evaluation. During the rehabilitation period a full day's activity schedule was initiated for each patient with emphasis upon making him do the maximum of which he was capable and increasing this at a steady rate. All procedures were carried out by the therapist in accordance with the prescription of the physiatrist. Remotivation of the patient was an important phase of his progress. The numerous problems inherent in the rehabilitation of a predominantly neurological group of patients, most of whom were over 55 years of age, many of whom had experienced long periods of hospitalization, were varied and complex.

"The immediate goal was to remove as many as possible physically and psychologically, from a dependency status to an independent or semi-independent status with the possibility of eventual discharge from the hospital. The long range goal was to delay or prevent the necessity for future hospitalization for those discharged."

The age of the patients was from early adult to late old age, with the majority (81 per cent) over 45 years of age. The mean age was 55 years.

"In general, the characteristics were those of a group of early old age persons with declining or non-existent economic potentials. All were physically disabled; a great number were chronically ill, with many having histories of long periods of hospitalization prior to referral for rehabilitation."

The largest diagnostic group consisted of 37 patients having some type of brain disease resulting in paralysis, approximately half of which was hemiplegia. Of the 37 patients, 27 were over 55 years old. The study says:

"The influence of age upon the number of diseases present is apparent. Among patients under 45 years of age, two diseases were diagnosed, while after the age of 45 years, an average of four diseases per person were diagnosed."

Seventy-six patients of the group of 105 completed their treatment and rehabilitation by the physical medicine and rehabilitation service. The remaining 29 patients did not complete their regimen for varied reasons. An average of 185 days per patient was necessary to rehabilitate the 76 patients who completed rehabilitation.

"The largest diagnostic group, 54 patients with disorders of the nervous system, were under therapy for the greatest length of time or, on the average, 210 days each. All 76 patients were discharged from the General Medicine and Surgery Hospital, either to the community or to the Domiciliary Unit. The approximate cost per patient day for all Physical Medicine and Rehabilitation Service activities was $1.30 or a total rehabilitation cost of $18,287 for those completing therapy."

The mean number of rehabilitation days per patient ranged from 21 to 210; the mean cost of rehabilitation was from $27.00 to $273.00.

Of the group of 76 patients completing their regimen, 34 were discharged to their homes, and 42 were transferred to the domiciliary unit on an ambulatory basis and were able to perform self-care.

"From a cost standpoint, 45 per cent of the total number rehabilitated were completely removed from the Los Angeles Center, and the cost of maintaining the other 55 per cent was reduced from $15.08 per day to $3.04 per day. The percentage of patients who at referral were ambulatory with and without aid increased from 24 to 73 per cent. Inversely, the percentage of semi-ambulatory patients decreased from 58 to 27 per cent. No bed cases remained."

The increase in percentage of ambulatory patients was about 48.7 per cent and the corresponding decrease in percentage of semi-ambulatory patients was about 30.3 per cent.

Based on the computed per diem cost for patients in general medical and surgical hospitals, the cost of hospital care for the group of 105 patients at the time of their referral to physical medicine and rehabilitation was about $1583.00 per day. On completion of the study, the per diem cost of care for those remaining at the center was $378.00, a reduction in cost of 300 per cent, or an annual saving of approximately $440,000.00.

Other professional groups of the center participated in the over-all objective so that the entire project was one of a team approach. The study concludes,

"While the field of geriatrics is in the realm of general medicine, it is reasonable to assume that the improvement of this particular group is largely the result of the full range physical medicine and rehabilitation service program. In terms of dollars and cents, the discharge of 76 patients from the general medicine and surgery hospital is saving the government approximately $30,550 per month. Since these patients were considered permanent custodial or nursing problems, the savings are real and would ordinarily have been a monthly expenditure until the patients died."

Comments on this excellent study have been given in considerable detail since it further corroborates several previously reported studies made in the Veterans Administration with similar results. The economic savings are comparable with those reported in the past by the Baruch Committee, Dr. Howard A. Rusk, and others. The study proves again that early referral to physical medicine and rehabilitation is to be emphasized, since several patients of the group were referred to our service after long-term hospitalization because of the common opinion that they would not respond to intensive rehabilitation procedures. Finally, the study confirms again the effectiveness, efficiency and economy of the present organizational pattern of physical medicine and rehabilitation in the Veterans Administration.

The psychological, social and vocational situations of the geriatric patient require careful analysis, and their solution should be timed and geared with the total rehabilitation process. In the Veterans Administration a direct attack is made upon these problems through the medical rehabilitation board which functions under the chairmanship of the Chief, Physical Medicine and Rehabilitation Service. The psychologist, social service worker, and vocational adviser, as well as staff members of the nursing service and other medical specialties, pool their information and advice at meetings of this board so that the team approach in the treatment and rehabilitation of the patient can be properly carried out for the latter's benefit. There is further urgent need for economic, social and community planning, wisely directed, to aid geriatric patients in a successful transition from the hospital to an occupied, useful, and frequently productive life in their homes and communities.

The challenge confronting us in the health and rehabilitation problems of aging and aged patients will continue to become a greater

one; it increases constantly in direct proportion to the discovery and development of medical advances for saving and prolonging life. The dramatic increases in life expectancy, the continually growing number of elderly people, and the dynamic effectiveness of our rehabilitation procedures: all of these should provide adequate motivation for us to give earnest attention to restoration of the aged patient. We must continue intensive studies in this field so that we may further improve the effectiveness of our methods. Active, coordinated research into the numerous aspects of prevention, diagnosis, treatment, rehabilitation, and resocialization of patients as they change with the aging process, must be initiated and carefully carried through. We know that we have much to offer through the procedures and technics of our specialty.

Instead of an attitude of uselessness and only an effort of palliation for the aging and aged, let us assume a sense of hope, and reassurance, and direct a positive approach toward helping them. Through a dynamic program of effective rehabilitation procedures we will help them to achieve a full life of comfort, happiness and usefulness. They will regain their dignity and self-respect. These are the privileges and responsibilities of every physiatrist.

REFERENCES

1. Stieglitz, Edward J.: Geriatric Medicine. 887 pages. Philadelphia: W. B. Saunders Company, 1942.
2. Veterans Administration Center, Los Angeles: It Pays to Rehabilitate (Physical Medicine and Rehabilitation Service), pamphlet. 20 pages. December 20, 1951.

DISCUSSION *(Abstract)*

Dr. Ben L. Boynton, Houston, Tex.—Restorative medicine, the process of planned, purposeful recovery, has a very real contribution to make to the problem of the geriatric patient in the way of socialization and in providing purposeful activity.

Restorative medicine should be thinking increasingly of the matter of nutrition. It has been said that all oldsters, or those who are in the neighborhood of sixty-five and over (and many of us are approaching that at an alarming rate) have a negative nitrogen balance. That being the case, it behooves us then to become interested in the protein intake in these older patients.

In our own experience in Houston, we have found that the older age group, only when it is eating well, can become interested in really purposeful activities. A palatable protein concentrate is of invaluable assistance in providing an adequate nutritional program.

THE CHANGING PROBLEMS IN PUBLIC HEALTH*

By WILSON T. SOWDER, M.D.†
Jacksonville, Florida

The title of the subject assigned to me suggests that I may be expected to present to you today an array of statistical tables and charts showing the remarkable decline in the incidence and prevalence of the communicable diseases in recent years; and perhaps to point out in the last few minutes that it would be well for us to turn more of our attention to such new fields as mental health and the chronic diseases. However, so many good articles have already been written on this subject, and so many good talks delivered, and so many of you are already familiar with these facts that I hope you will forgive the omission of such statistical data. Our experiences throughout the South are all about the same, although there are significant variations in results attained in connection with our various special health programs, not only from state to state but from locality to locality. These differences are traceable to differences in geography, climate and soil: differences in the percentage of Negroes, and economic, social, and educational levels of the population; and differences in the quality, quantity and intensity of effort devoted to different problems in the various areas. The South has had more than its *pro rata* share of public health problems, and its basic resources to contend with them have been less than the average for the rest of the country. Our per capita wealth has been comparatively low as have the educational levels of the mass of our population, and the presence of a high proportion of Negroes with their special problems have represented a multiplicity of handicaps to us in our efforts to make the South as healthy, and healthier, than the rest of the country. Furthermore due to our mild climate, the characteristics of our soil, and other geographic factors we have had more than our share of regional disease problems. We have had hookworm, murine typhus

---

*Read in Section on Public Health, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

†State Health Officer, Florida State Board of Health, Jacksonville, Florida.

fever, malaria, yellow fever and dengue fever to contend with as well as others that could be named which occur less frequently in the North and West. Also the venereal diseases are, to some extent, regional in character, and are more prevalent in the South. This may be due in part to our mild climate which makes year-round outdoor courting practicable.

Bundling was never in vogue here and is now, I understand, little practiced in the North, or at least not under parental auspices. Of course the bulk of our problem is in the Negro race, but the last time I studied the figures we also had higher rates among whites as compared to the country as a whole.

Now if you think I am mentioning these facts by way of apology for our public health work in the South let me hasten to reassure you. It is my firm and considered conviction that we in the South, even though we have had more to do, and less to do with, have led the nation for the past 25 years in the public health field. We have a record of which we all have every reason to be proud. Speaking generally, and with exceptions allowed both in and out of the region, we have had better and more stable state health departments. The hot winds of political turmoil have seldom even rattled the window shutters of our health departments and disturbed our work, even though in all of our states none of us is exempt from accountability to the tax paying and voting citizen through political channels. This freedom from political dictation is not due in my opinion to the one-party system as some think, because the bitterness and partisanship of some of our political campaigns can hardly be exceeded in the two-party states. I believe, on the other hand, that this favorable situation is due to the fact that we have earned the respect of all political factions by honest toil and professional competence, and that it is for that reason that we are considered in a sense in the same class with our state supreme courts, and universities, as above and outside of politics.

We have an even more enviable record in the field of local health work. Our county health departments are the models for the rest of the country. They are set up on unitarian principles, and within their jurisdictions represent the combined efforts and resources of the federal, state and local government. Also to a remarkably greater extent than elsewhere they combine the resources and do the work of the municipalities and school boards within the area. They do school health work, milk inspection, restaurant inspection, vital statistics, and all this work is planned and directed by a full time medical health officer. In fact the South is the native habitat of the full time local medical health officer, as well as the stronghold of the unified and consolidated city-county-school health department. For some years now this plan has enjoyed national favor, but more recently doubt and defeatism have reared their heads and we may find it necessary soon to defend our ideas before those who have had less success in adopting them. Now I know that this picture is not universally applicable in the South but it is accurate in general, and we have certainly gone further in this direction than have other sections of the country. We are, at the very least, on the right track and I hope that we will not deviate from the path we have been following.

In spite of many handicaps, we also have a very good record compared to the rest of the country in specific death rates and rates of disease incidence. Malaria, yellow fever and smallpox are not seen among us except when contracted elsewhere. Deaths from diphtheria, typhoid fever, typhus fever, and other formerly prevalent communicable diseases are now rather rare; and only a few cases occur. The downward trend in deaths from tuberculosis has kept pace with the country as a whole; and in spite of the greater problem previously noted we have made tremendous strides in the fields of venereal disease control, and in maternal and child health. Although we cannot as yet claim equal or lower rates with the rest of the country we have made greater strides when we consider our relative standing a decade or so ago. I could go on and on in recounting the wonderful work that has been done in public health in the South, and if I had the time I could provide almost endless documentation, and statistical proof that we have done well, but the facts are already before those who care to see them. I doubt however, that many of you will disagree with my

thesis so far, but you are concerned as I am with what we do next. There is a ferment and an undertone of worry in the field of public health and preventive medicine today which I think we share with our colleagues in other regions of the country. This worry about our future is I believe more intense and obvious in the case of the physician in public health than is the case among our other professional colleagues, and there are reasons for it. The physician is generally an administrator in addition to his other duties and is concerned about the future of the entire public health program as well as his own place in it—and we have some reason for concern. About fifteen years ago there began an era of federal subsidies in the field of public health and since then we have become accustomed to increased financial assistance year by year, either for existing programs or for the establishment of new programs. These subsidies stimulated more state appropriations, and together these stimulated local appropriating bodies. Many of us have therefore spent our entire public health careers in an era of expanding budgets, expanding staff, and expanding programs. Many of us believe that if we do not expand we are making no progress and that our efforts are wasted. There have been signs, however, for several years that the tax payer is becoming balky as far as all levels of government are concerned, and many of us have learned that the economy minded tax payer and his representatives on appropriating bodies do not always discriminate too sharply when the axe of economy is wielded. To make things worse this development comes after years of increasing inflation so that even with the same funds, or with moderate increases, we cannot keep up our work at former levels. Furthermore we are plagued with personnel problems, especially recruitment, and particularly the recruitment of our own kind, public health physicians. Most of us looked forward to the end of World War II as the solution of this problem but our hopes were soon dashed because of our own relatively low salaries, the siren call of remunerative private practice, and more lately the onset of the Korean war. We have been like a man on a stepladder in a flooding basement room, and although we have so far been able to keep our heads above water, some pessimists see the ceiling overhead but not the windows. Also aside from these nagging worries some seem to think that the day of the medical health officer is over because there is little left for him to do that requires medical training. They say that the communicable diseases have been conquered and they either believe that there is no proper place for us in the campaign against the chronic diseases, or they have no stomach for the explorations, skirmishes, and perhaps battles that are necessary to gain us a recognized place in the chronic disease field. Some, especially outside the South, have already selected and are training our successors, the lay health officers, who may or may not be content to wait for our retirement or demise before taking over the helm of public health. The argument is to some extent flattering and persuasive. We are a valuable and scarce commodity and our time should not be wasted on non-medical matters, but we should leave to others such trivia as budget preparation meeting with appropriating bodies, direction of personnel, educational talks; and our time should be spent on strictly medical matters such as, I presume, the holding of clinics, the examination of school children, and the reading of x-rays. While I concede to no one in the appreciation that I have for lay assistance in public health I am conscientiously opposed to the principle of the appointment of lay health officers at either county, district or state levels. The statement of such a viewpoint may seem unnecessary to this group, but the point I wish to emphasize is that we may soon find our practice in this respect different from the rest of the country where the idea seems to be taking hold and growing. It is my hope therefore, that we in the South, in spite of many obvious difficulties, will hold the line and adhere to the principle of full time local medical health officers. It is my belief that our recruitment problems will not always be so difficult, nor is there reason now for despair and for abandonment of the ship on which we have travelled far. We are not alone with our problems. Hospitals, medical schools, and other agencies have the same troubles in finding physicians, and we should not forget also that department stores have trouble finding clerks, builders have trou-

ble finding carpenters, and housewives have trouble finding maids. Let us therefore stand firm and carry on as best we can, and trust that our persistence will be rewarded in the future as it has been in the past.

Public health as a career for physicians has admittedly some lack of glamor to the young and uninitiated. We should all do more to add to the appeal of our calling. It could be more glamorous and enticing. All of us already know, because otherwise we should not be in it, that public health has a subtle charm, and the embracing of it endows us with a quiet and lasting satisfaction that no other specialty of medicine can give. We have no reason to apologize for our specialty, and my opinion is that we only need be faithful and steadfast, and in the years ahead more and more of our fellow-physicians will be glad to join our ranks.

I am convinced also that only those with a defeatist attitude can maintain that we have finished our job and should retire from the field. Even in the field of communicable diseases where we have made the greatest advances there is much to be done. Which of the communicable diseases has been so far banished that it cannot return? We still have the mosquitoes that carry yellow fever and malaria; we still have the rats and fleas that carry typhus fever. Our protective measures of immunization against smallpox, diphtheria, whooping cough and tetanus are by no means complete and impregnable. In spite of our great gains in the fields of tuberculosis and venereal diseases, and maternal and child health most of us could double our efforts here and do so profitably. The field of environmental sanitation has many possibilities for expansion in the public interest, and much is demanded in such areas as insect control, and stream pollution. Control measures against pollens that cause allergic conditions should be studied. We have hardly touched the problem of mental health, and our leadership in the field of gerontology is badly needed. The great field of chronic diseases has many facets and there are many proper avenues by which we may approach this problem without offending our fellow physicians in private practice. Health education is obviously needed. Casefinding in diabetes is certainly capable of saving many lives, and mass instruction can be productive in the case of diabetes, heart disease, obesity, hypertension, alcoholism, epilepsy and many other conditions. The public health physician should be the leader of the public health team in all these endeavors. There is room, however, and a need for the skills of all the public health professions in tackling the problems that I have outlined, and my arguments for the retention of the medical health officer will not I hope be taken as showing any lack of respect for the usefulness of any of the other fine professional groups in public health. Neither, let me emphasize again, do I fail to appreciate the need for lay administrative assistants in public health. My attitude is adequately indicated by the addition of the word "assistant." I do not want lay administrators to be in a position to chart our course, or steer our ship, or select the enemy to be attacked, or to say whether we fire our big guns or the little guns at any particular target. I hope that these functions of our public health programs will remain in the hands of medical health officers. Also I do not wish to give the impression that I am opposed to having sanitary engineers, public health nurses and others with professional training on the staff that does the planning and administration. These groups will be even more opposed to having direction and supervision delegated to non-technical persons, and they would have much more to lose by such a trend.

I have outlined for you a good many possibilities to absorb our time and energies in the future, but some of you will ask how we can embark on new ventures if we cannot expect increases in our budget and personnel. Obviously we can not, unless we change our plans and change the emphasis on our present programs. My feeling is that we should constantly survey our problems, and our programs and our methods of attack. We should be eager to make changes when it is clear that we can do more good for more people by doing something else. We should not be bound by traditional practices but should plan our work according to the needs of the times. We should not be too dismayed if our budgets are cut. This has happened before and will happen again. We can with wise planning get just as much pleasure and sat-

isfaction and give just as much service to the public per dollar spent with a two million dollar budget as with a four million dollar budget; or with a fifty thousand dollar budget as with a hundred thousand dollar budget. We should of course keep our public and appropriating bodies informed as to what we need to do a complete job, but having done so our responsibility is to spend wisely, and economically, and profitably the funds that are entrusted to us, such as these may be.

Let me say again that in spite of the manifold problems that we face in these changing times it is my hope and expectation that public health physicians in the South will continue to demonstrate the leadership in our profession that they have manifested in the past. I have a feeling that the need for good leadership will be very great in the difficult years ahead.

DISCUSSION *(Abstract)*

Dr. Ben F. Wyman, Columbia, S. C.—Prior to 1878, there was no state public health program in South Carolina. There were, however, certain public health laws. Most of these laws were directed toward quarantine against the introduction and spread of yellow fever. Since yellow fever came in by boat and since, when epidemic, it affected the coastal area, Charleston was its principal center. The first law with that objective was passed in 1698. In 1712, what might be considered the first state health officer was created by law. His duties were to examine ships' passengers at the entrance to Charleston Harbor and to determine whether or not it was safe for the ship to dock.

In 1875, the South Carolina Medical Association appointed a committee called "Committee on State Medicine and Public Hygiene." The report of this committee says: "There is no more correct and certain index of the successful working of a government conducted only in the interest of the people than the laws which exist and are enforced for the preservation of health and the warding off of disease."

As a result of the continued interest of the medical profession and finally of the Legislature, in 1878 a law was passed providing for the State Board of Health. Then as now, it provides the South Carolina Medical Association, the Comptroller General and the Attorney General, in their official capacities, as a Board of Health. Provision has been made for the Executive Committee of seven doctors, one nurse, one pharmacist, and one dentist together with the two constitutional officers named, to function during intervals between meetings of the Board of Health. As far as we know, the Board of Health is never called together and the Executive Committee carries on its duties and functions.

The original law assigned several important duties to the State Board of Health. Perhaps the most important was that of investigating the causes, character and means of preventing such epidemic and endemic diseases as the state was liable to suffer from by reason of climate, location, occupation, water supply, drainage, street cleaning practices and other similar factors. It should be noted that each of the factors named was widespread in action, affecting large groups of people equally. There was no intention to assign to the Board of Health any role in the treatment of the individual.

To show the interest and desire of the medical profession, because truly the Board of Health of South Carolina is the medical profession, the Second Annual Report of the Board to the General Assembly elaborates on this extensive program. I wish to quote a statement from the report as follows: "The following are subjects for consideration and special reports as time and means permit:

(1) Best modes of securing and preserving the health of the body from a knowledge of its vital process, etc.

(2) Vital statistics.

(3) General sanitation.

(4) Prevention of diseases.

(5) Cost of epidemics: economy of sanitation.

(6) Nature and danger of contagion, putridity, etc.

(7) Forcible isolation of infectious cases.

(8) Construction of hospitals and infirmaries for communicable diseases.

(9) Longevity in the different counties.

(10) Geographical, geological, climatic and other factors in health and longevity in the several counties.

(11) Meteorology and its effects upon health.

(12) Botanical, mineral, agricultural and other resources of the state, and their effect upon health and longevity.

(13) Influence of moisture or its absence upon the production of consumption.

(14) Personal hygiene and its effect upon production and prevention of disease.

(15) Air purification and ventilation in homes and places of assembly or congregation.

(16) Water pollution and purification.

(17) Construction, management and disinfection of water closets, privies, etc.

(18) Model lodging houses, cheap homes for the poor.

(19) Accident prevention and treatment.

(20) Cremation and burials.

(21) Study of high death rate in Charleston and its effects upon trade and prosperity.

(22) Various trades in villages, towns and cities.

(23) Instruction in sanitary science, hygiene, etc.

(24) Topographical, sanitary or other features of towns and cities and sections, with a study of their advantages or defects.

(25) The nature and treatment of inebriety and legal management of inebriates.

(26) Prevalence and prevention of criminal abortion."

It is unlikely that this ambitious program was ever completed. However, I think that it should be stressed

that each of these twenty-six projects was within the field of public health. They had a bearing on mass or territorial prevention of disease. In no way did they attempt to invade the province of the private practice of medicine, and in no way did they seek to come between the private practitioner and his patients.

From the foregoing, we have clearly shown that public health in South Carolina is under the control of the medical profession and, hence, the viewpoint of the profession as to the future of medicine is clearly of considerable importance and will, in due course of time, be considered.

It certainly is not the intent of this discussion to enter into the numerous programs which concern malaria control, hook worm control, the development of sewage disposal and safe water supplies and the usual programs of assistance, such as maternal and child health, crippled children, prevention of disease, laboratory services, industrial health services, the control of specific diseases such as tuberculosis, venereal disease, heart disease and cancer control. The public health programs, after years of achievement, have drifted rather far afield from the objectives expressed in the Second Annual Report. Our activities have moved well over to a borderline area between public health, or preventive medicine, applied to the group, and the individual treatment of cases of disease. Many of these programs have primarily come about as a result of funds from the Federal Government. At the present time, more than half of the moneys expended by the Health Department has come from Federal grants and appropriations. As a result of the expansion of activities made possible by these grants, either because such funds helped finance particular projects or because they liberated state moneys for other purposes, the treatment of individuals has been undertaken. Some of this treatment is remotely preventive as applied to the population as a whole. In our state an example would be the state hospital for the treatment of tuberculosis. The therapeutic features of the venereal disease control program are another. However, the crippled children program and the rheumatic heart disease program are directly curative without any element of prevention.

One of the problems connected with the future is the extension of activities to therapeutic medicine in the interest of the individual and, of course, this has and will bring about the greatest criticism. If this type of activity was limited to the true indigent, if it was charity state medicine, there would be less criticism. However, the problem of indigency, as handled by certain welfare groups, is the cause of great concern for there certainly is great laxity in the interpretation of the word "indigency."

We, in South Carolina, believe that we are trying to stay away from the problem of the Federal Government's leading us into the welfare state or socialism and the insistent and incessant efforts of the administration to inaugurate a system of state medicine.

Dr. Joseph E. Schenthal, New Orleans, La.—I wonder if a community educational program is not in order to point out the importance of maintaining a medical community health program once it has been established. Very few communities actually realize the amount of time and effort and interest put into the community health by professional people, such as nurses, physicians, and allied professions. Many good community medical programs are disrupted or delayed by changes in yearly budgets but possibly would not be changed if an intense medical educational program were carried out in the community. This might indicate to the community the tremendous loss it sustains in not carrying along with the medical programs.

Dr. R. H. Riley, Baltimore, Md.—Dr. Sowder mentioned the aging sick. I have said in some of my talks that I believe that is the pressing public health problem today. The medical profession and the health departments have extended the life span, and have thus increased the number of persons who are most likely to be attacked by chronic disease.

In 1900 there were 50,000 persons in Maryland over 65. In 1952 there were 171,000.

In Maryland we have one hospital already constructed for chronic cases. We have a temporary hospital at Camp Ritchie, but we are moving all those patients down to a communicable disease center in Baltimore. We are going to increase the capacity of this. We have two million dollars for construction of more beds for rehabilitation and occupational therapy, and a third hospital for the aged is to be constructed in the near future. Should we depend on building more hospital beds, or utilize the Johns Hopkins Hospital and the University of Maryland Hospital: let these chronic cases get the acute treatment and come over to us for rehabilitation and occupational therapy and some treatment. It is going to require all the medical knowledge we can bring to bear, and in addition we shall need all the lay help available.

The medical end of it may be the smallest part before we are through. These persons must have homes. They must be fed and entertained. This is the biggest public health problem that has ever faced us.

INDUSTRIAL MEDICINE AND PRIVATE PRACTICE*

By P. A. Davis, M.A., M.D., F.A.P.H.A.
Akron, Ohio

That there has been a great change in the concept and scope of industrial medicine during the past two decades is quite apparent to anyone who takes the time to reflect or to review the history of medicine of that period.

In the first place, we find substantial increases in the number of physicians limiting

*Read in Section on Industrial Medicine and Surgery, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

or giving special attention to industrial practice.

Secondly, we find a great awakening among employers, big and little, to the value of good medical and health services for their employees and the indirect effect of such services on production.

In the third place, we find an increasing demand on the part of employees themselves for protective measures while at work and for effective medical care when they are disabled as a result of employment.

Perhaps the outstanding change which has taken place within the memory of many physicians has been in terminology. Today the emphasis is placed on "industrial health" in contrast to "industrial medicine," in use not too many years ago.

Industrial health, as we understand it today, and as defined by the Council on Industrial Health of the American Medical Association, is an inclusive term, incorporating three major types of activity, namely:

(1) Medical and surgical care to accomplish prompt restoration to health and earning capacity following industrial accident or disease.

(2) Prevention of disease or injury in industry by the establishment of proper control over industrial environment.

(3) Education of employees about healthful living, both in and out of the industrial environment.

Keeping this in mind, it is not difficult to realize that the medical profession as a whole has a very definite and important role to play.

Although many more physicians than in the past are limiting their practice to full time or part time industrial health activities or giving this type of practice special attention, we know that from two-thirds to four-fifths of the services rendered to industrial employees are provided by physicians engaged in private, general, or specialty practice.

Therefore, it is perfectly obvious that: (1) physicians in private practice must adequately prepare themselves to render the kind of service which will be of real value to the disabled employee or to the plant management and reflect credit on the medical profession as a whole; and (2) there must be the closest cooperation and understanding between the full time industrial physician and the private practitioners of his community.

Let us take a look at these two points briefly.

The physician in private practice, obviously, must be prepared to render proper curative and reconstructive services to those with occupational injuries and diseases. Our educational programs should place greater emphasis on those subjects in order to give all physicians an opportunity to become more competent in the management of industrial cases.

However, the private physician also must take an increased interest in the preventive aspects of industrial health. He must acquaint himself with the causes of industrial exposures and hazards and methods of control. Many plants cannot engage the services of a full-time physician. Thus, they must depend on physicians in private practice for advice and guidance on these matters. If the physician consulted on such questions cannot provide proper advice, he should at least know where he or the plant management can go for reliable information and consultation. Opportunities for a leading role in the preventive aspects of an industrial health program are great for many physicians in private practice. Many industries requiring pre-employment physical examinations and periodic examinations for employees must look to physicians in private practice for such services. Thus, the private physician must not only be prepared to conduct a proper and adequate examination, but he also must have some knowledge of the working conditions of the plant, materials made and the processes to which employees are exposed. If he has this information, he can make a more objective and more helpful report, a report of real value, both to management and the employee.

Little need be said as to the part the private physician must play in handling employees with non-occupational disabilities and defects which may be picked up through physical examinations conducted in industry. That is the daily job of the physician. Where there is proper cooperation between plant physicians and physicians in private practice, the latter stand to gain materially through references of workers to family physicians for curative and corrective services.

The role which the full time or part time physician in industry should play has become rather clear cut and definite. It has been said

that he should be the "health officer" for his plant. Without going into detail, his general functions might be as follows:

Appraisal and control of plant sanitation; regular inspection for occupational disease hazards; adoption and maintenance of adequate control measures; supervision of first-aid and emergency services; assuming responsibility for prompt and early treatment for all disabilities arising from employment by staff physicians or physicians in private practice; cooperating with employees and family physicians with respect to treatment of non-occupational disabilities and defects; supervision of adequate record keeping on disabilities, absenteeism, and so on; health appraisal of workers for management; supervision of rehabilitation services within industry and establishment of a good health program for employees.

The industrial physician who wants to make a success of his job will consider himself an ally of the physicians of his community. Services which can properly be handled by physicians in private practice should be referred to them. Efforts should be made to give practicing physicians an opportunity to take part in the industrial hygiene and preventive programs carried on by the plant. There should be the closest working relationship between the plant physician and family physicians in an effort to bring workers and their family physicians together for the correction of defects picked up through the plant's physical examination programs. The plant physician will be able to devote less time to the curative aspects of industrial medicine but more time to the industrial hygiene program of his industry, if he establishes the proper relationship with physicians in private practice and turns over to them the responsibility for necessary curative and remedial services.

Cooperation between the plant physician and physicians in private practice, rather than competition, must become the goal of an industrial health program in any industry in any community, if it is to succeed. I believe this can be accomplished. There are no insurmountable obstacles, none which cannot be worked out over the conference table and perhaps through discussions and understandings with the industrial health committee or other officials of the local medical society.

We have come a long way during the past two decades. More physicians in private practice are better prepared now to take an active part in industrial health programs than ever before. As I have indicated, it is important for our medical societies to stress this phase of the practice of medicine in their educational programs. At the same time, we find that more and more industrial physicians are beginning to realize that they must have the help and consultation of private physicians. Many of the causes for misunderstandings have been dissipated. New procedures, which make it possible for the plant physician and his colleagues in private practice to work together, have been established. In communities where these progressive steps have been taken, the results have been better health services and working conditions for employees, increased production for industry and a cordial relationship between members of the medical profession in private practice and industrial physicians.

Now, I should like to present to you in some detail a diagnostic procedure which has been in operation for many years and has worked efficiently for both the industrial physician and the physician in private practice, who may be called upon to handle the suspected case of occupational disease.

The greatest pitfall in diagnosis of occupational disease is due to the lack of knowledge of the substances or substance used in the factory where the case originated.

In order to make a correct diagnosis the industrial physician and the man in general practice must use all the scientific means known, such as x-rays, metabolism, blood examinations, microphotography, animal experiments, chemical laboratory procedures, dust collectors and human experiments in cases of dermatitis. One of the first procedures in making a diagnosis is the personal history which includes the past and present, for many industrial toxicoses are cumulative. The physician should know whether the individual has worked in lead or benzol or some other substances in previous years before his current employment, to know about his present work, how many parts per million of solvent, or

what is the dust count in his particular working area. One should also know how many years he worked in a coal mine or quarries before his present employment; his past allergic history as well as his skin susceptibility. It is readily seen from these few queries that it is very important to get a good history. The time allotted for a presentation of all the data connected with diagnostic procedure is so small that it will be necessary to pick out two or three substances and present to you the procedure.

BENZOL

Benzol is a hydrocarbon of the formula C_6H_6, containing nothing but carbon and hydrogen. It is very toxic and produces its action through the blood stream to other organs. Safe concentrations are 100 P.P.M. and less.

Investigation.— (1) History of exposure, what length of time has the individual been exposed? Has he worked previously in benzol? At what particular place and on what particular job did he become exposed? Have air samples been taken and examined for benzol?

(2) Examination
- (a) Past history
- (b) Present history
- (c) Chief complaint
  - (1) Peculiar brackish taste
  - (2) Slight giddiness
  - (3) Unsteady vision and slight headache
  - (4) Nausea and vomiting
  - (5) Dizziness, "benzene jag," odor of benzol
  - (6) Weakness, anemia, purpura
  - (7) Increased nervousness with increased pulse, nose bleed, uterine bleeding, bleeding from gums and paraesthesia
  - (8) Dermatitis
  - (9) Nephritis

There develops a slight leukopenia and erythropenia with a slight hemoglobin reduction. With increased absorption this progressively gets worse and the following develops:

(1) Increased leukopenia
(2) Increased erythropenia
(3) Lymphocytosis
(4) Development of few transitionals. A point is reached where the blood forming organs are nearly suppressed and new cells do not form rapidly
(5) Increase in coagulation time
(6) Decrease in blood calcium
(7) Decrease in antibody formation
(8) Severe decrease in hemoglobin formation with increase of hematin in urine
(9) The beginning of appearance of endothelial lining cells in the blood stream. The appearance of these cells indicates the serious if not fatal stage of the poisoning
(10) Complete cessation of formation of new blood cells

(3) Clinical laboratory work
- (1) Blood counts complete with smears
- (2) Hemoglobin determination
- (3) Coagulation time
- (4) Calcium determinations
- (5) Urinary examinations complete. Determine if there is a decrease in inorganic sulphates

This decrease takes place a long time before there is any evident change in the blood picture or clinical picture. This factor is one which should always be considered when making a diagnosis of benzol poisoning. In a paper by the author (*Ohio State Medical Journal,* 1929) on benzol poisoning, I gave the following data and findings as sufficient cause for the removal of contact with benzol:

(1) Slight purpura or hemorrhage from mucous membranes or other organs
(2) Reduction in white cells of 1500 below normal
(3) Reduction in red cells of 10 per cent to 15 per cent below normal
(4) Reduction of hemoglobin below 80 per cent
(5) Slight variation in coagulation time. I should like now to add the sixth factor and that is
(6) A sudden and marked decrease in inorganic sulphates which does not show an increase after two days rest

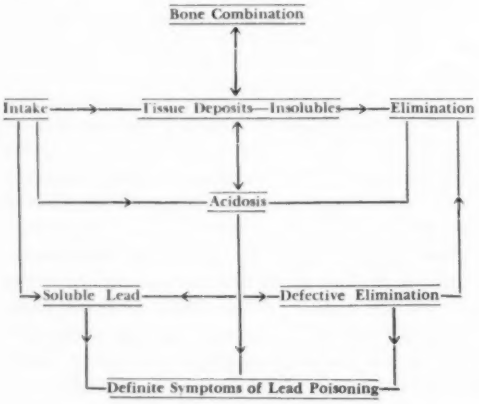
LEAD

Much has been written about lead or its compounds and of course all of you are familiar with its uses in paint, ethyl gasoline, storage batteries and various other materials. In the past a diagnosis of lead poisoning has been based entirely upon a symptom-complex, chiefly an intestinal colic. I even know a very good surgeon who removed an appendix for its cure, and only recently I saw a case of paralysis (hemiplegia) due to a pontine hemorrhage which was diagnosed as lead poisoning by a neurologist.

Such a diagnosis would not have been made if a complete laboratory study of the case had been made. In cases suspected of having any lead absorption the same routine of examination must be followed as for benzol or any other toxic material. However, when we get

to the laboratory examination this is different and there should not be any slip in the diagnosis if all the factors are considered.

If you will study the following mechanism of the behavior of lead in the system you will have a very good idea as to its treatment and eliminations:



If the elimination is normal, no acidosis is present, and the amount of intake of lead compounds is at a low concentration, the human body can combat it for some time without any definite symptoms. If the intake concentration is reduced in the body by precipitation of insoluble compounds the symptoms do not develop rapidly. For example, a worker takes into his body 2 mg. of lead per day; 0.5 mg. is precipitated as lead sulfate in a lead line, 1.25 mg. is eliminated by the kidneys and intestines and the other 0.25 mg. remains as a soluble lead salt, some of which may later be converted into an insoluble compound. At this rate it will take some little time for any acute symptoms to develop, other than the lead lines. The whole process is a chemical reaction with the precipitation of an insoluble compound of lead. If we had some means of keeping the lead out of solution in the body very little harm would be done other than that from the mechanical deposit in the tissues. X-ray examinations of the epiphyses of long bones often show increased calcification.

The predominant feature in the blood work is the presence of the punctate basophilic red cells, reticulocytes, mononuclears and a secondary anemia. These factors are readily discovered when they first develop if monthly blood examinations are made. Basophilic degeneration of red blood cells may be due to many other conditions:

(1) Pernicious anemia
(2) Leukemia
(3) Chronic lead poisoning
(4) Carcinoma
(5) Sepsis
(6) Malaria
(7) Tropical anemias
(8) Conditions associated with the destruction of red blood cells
(9) Chlorosis
(10) Severe hemorrhages
(11) Chronic aniline poisoning
(12) Some intestinal parasites
(13) Occasionally in healthy individuals due to adsorption of hematin

In very severe conditions of lead poisoning basophils sometimes disappear and then reappear on improvement. This condition would lead one to believe that it is a regenerative process, but on the contrary, new young cells are thrown into a state of basophilic degeneration by being bathed with a soluble lead compound circulating in the blood stream. The normal lead content of the urine is from 0.005 to .04 mg. per liter; however, this varies according to locality. The feces vary in concentration from 0.05 to 43 mg. per 100 grams of feces. This is also a variable as to locality. By locality I refer to those living in the large city exposed to the dusts of the street where the content of lead is higher than those who live in the country or a small town where the lead content of the dusts and smokes are low.

After the examination has been completed and all clinical studies are finished, the final decision depends on:

(1) Differentiation of the symptoms
(2) Presence of lead in the urine, feces or blood serum
(3) Presence of lead line. The lead line is due to the deposition of lead sulphide in the tissues near the border where they come in contact with the teeth. This sulphide of lead is probably formed due to the liberation of sulphur compounds at the gum margins or to disintegration of nuclear material, especially marked around the gingival margins of the gums.
(4) Presence of basophilic degeneration of red cells at least 1 to 10 fields. 100 fields should be examined. Increase in reticulocytes

(5) Differentiation of the causes of basophilic degeneration
(6) There is a porphyrn disturbance beyond normal limits

In suspected cases that have been quiescent it is always advisable to produce an acidosis in the system and then do the laboratory work; for the presence of an acidosis causes combined lead to be liberated in the blood stream and then eliminated through the kidneys and bowels.

CARBON TETRACHLORIDE, C CL_4

This substance is in wide commercial use in the laundry and dry cleaning business, rubber industry, machine manufacturing industries and is present in many liquid cleaners that are used in the household. It is the basis of some fire extinguishers because it is non-inflammable and excludes oxygen from the flames. It is a very valuable solvent but must be employed with caution.

Its fumes are not particularly distasteful. They are heavier than air and seek the lowest level. There is a characteristic factor about carbon tetrachloride and that is its ability to cause nausea very early on exposure which is a warning symptom. In September, 1934, I published an article on carbon tetrachloride saying that 100 P.P.M. was a safe working concentration. Since that time Henry Field Smyth has corroborated my findings and I believe that with this figure as a standard we can safely use carbon tetrachloride in industry. However, there are some conditions which prohibit workers from being placed on operations where it is used such as:

(1) Obesity
(2) Undernourished persons
(3) Pulmonary diseases
(4) Gastric ulcers or those who have a tendency to become nauseated and vomit easily
(5) Persons with hypertrophic or atrophic liver conditions
(6) Diabetes and nephritis
(7) Persons with glandular disturbances, especially of the thyroid and thymus
(8) Persons with blood disturbances or a myocardial degeneration
(9) Persons with diseases of the optic nerve
(10) Individuals with hyperosmia

Persons who are working with or around carbon tetrachloride should be examined frequently. If after examination any of the following symptoms are elicited, the worker should be removed and placed on a job in which there is plenty of ventilation and fresh air:

(1) Persistent nausea after having worked in a very low concentration for several eight-hour shifts
(2) Loss of appetite and loss of weight
(3) A 15 per cent reduction of hemoglobin
(4) Hyperacidity of the gastric contents
(5) Hyperacid urine with a marked chloride increase
(6) Persistent headache after eight hours rest and aeration
(7) Decreased blood pressure
(8) A marked poikilocytosis and anisocytosis, secondary anemia

While carbon tetrachloride is a very desirable solvent and a diluent for benzene to prevent fire, it is at the same time a very toxic substance even in its purest state. The redeeming feature of the toxicity is the fact that it produces symptoms by very slight absorption, and it may be removed before any serious conditions develop, principally damage to liver and kidneys.

The urinary sulphate changes are just the reverse from those of benzol.

THE DUST PROBLEM

While I believe that we have had a lot of pneumonoconiosis in the past the advent of the x-ray has made our diagnostic methods practically 100 per cent. Pneumonoconiosis is a general term denoting a pulmonary condition caused by inhalation of dusts. Specific dust conditions are designated as:

(1) Silicosis, silica dust
(2) Anthracosis, coal dust
(3) Abestosis, asbestos dust
(4) Siderosis, iron ore dust
(5) Chalcosis, copper dust
(6) Chalicosis, stone dust

However, all dusts do not cause pneumonoconiosis. The higher the silica content of a dust the greater the possibility of developing a fibrosis, and the higher the percentage of crystal content the greater the irritation.

The diagnosis of the type of pneumonoconiosis is based upon the following:

(1) Past history and occupation
(2) Physical examination
(3) Clinical examination of sputum
(4) X-rays of lungs

Since we have been studying the lungs of industrial workers by x-rays, there has developed an entity which should be termed the "industrial lung."

This condition I do not believe should be termed a pneumonoconiosis because it reaches a certain stage, does not progress any further and after several months to a year improves. There are no symptoms nor decreased capacity of the lungs. It is discovered only by a series of x-rays taken over a period of years.

INDUSTRIAL DERMATITIS

This subject is somewhat misleading for one would suspect that it is some specific entity of the particular industry, such as rubber dermatitis, leather dermatitis, and so forth. For purposes of investigation and study the following five important factors must be considered:

(1) What is the nature of the dermatitis and what is the part involved?

(2) What is the condition of the individual who has the dermatitis? About 3 per cent of all persons are more or less susceptible to some kind of dermatitis and this susceptibility varies according to certain body factors.
   (a) Acidosis or alkalosis of the system.
   (b) Endocrine disturbances, especially the thyroid and adrenals.
   (c) Diabetic tendencies.
   (d) Certain hematogenous and hepatic disturbances.
   (e) Certain types of skin: blondes and fair skins are more susceptible than others.

(3) What parts of the body are affected? Certain specific known diseases of the skin are limited to certain areas.

(4) What is the nature of the work that the individual does and what are the working conditions? For example, is it hot and does the individual perspire excessively? Or is it cold and is he subject to drafts? Are there fumes, dusts, oil, or irritating chemicals present?

(5) What are the personal habits of the individual? What are his home surroundings? What does he do while not working? What is his diet?

One must know all these various factors, in some cases in order correctly to differentiate some of the dermatoses. If the condition is diagnosed as an industrial dermatitis then it becomes a compensable disease under the laws of most states and a correct diagnosis and etiology will then enable one to treat the case properly.

The largest percentage of industrial dermatoses fall under two classifications, namely: the hyperemias, and parasitic infections. The hyperemias may vary from a slight reddening and itching of the skin to severe burns, pustular and vesicular formations. These conditions are caused by external irritants in most cases and we commonly term them chemical irritations.

Parasitic infections are very common, especially the Trichophyton group, commonly called ringworm and athlete's foot. These are present in gymnasiums, shower baths, locker rooms, swimming pools, and floors where there is dampness. They are also present in old shoes, boots, and socks which are not frequently cleaned and sterilized. We examined 200 men who were taking gymnasium and 85 per cent of them showed indications of ringworm infection of the feet.

Diagnosis.—The following points in the history should be known:

(1) Nature of work: what compound of dust, or solvent does the individual work with? How long has he worked with this substance? Has he had a similar skin condition before?

(2) Does removal from contact with the substance cause improvement?

(3) Is the individual of a hypersensitive type and has he any of the factors which predispose to skin rashes? Is he allergic?

(4) By the use of the patch test does he show a reaction?

(5) Have you differentiated from the well known and well described skin diseases?

(6) Microscopic and tissue examinations.

Many skin defects and diseases are present in the working men who apply for employment that have no connection with their work. From January, 1939 to January, 1945, 3,230 special examinations were made for employment and 10.5 per cent of individuals had some kind of skin affection which varied from acne to ringworm and was not connected with occupation.

Many cases of pre-employment skin conditions become worse when exposed to fumes, irritating chemicals, and extremes of heat and cold. Open lesions on the skin from trauma may be starting points of a dermatitis if some chemical irritant gains access. The differential diagnosis is the most important factor when confronted with an unknown skin affection. Occasionally a self-inflicted dermatitis is encountered and gives a lot of trouble.

CONCLUSIONS

For known poisons there are present in any good textbook methods for diagnosis; but for new and unknown compounds it is necessary to do much investigation. The diagnostic procedure must include the following:

(1) Animal experimentation
  (a) Blood examinations
  (b) Urine examinations
  (c) Tissue and organ examinations
  (d) Behavior symptoms
(2) Human observations and examinations
  (a) Blood examination
  (b) Urine examination
  (c) Tissue and organ examination
  (d) Behavior symptoms
  (e) History, past and present
(3) Study of the chemical structure of the substance and the possible reactions that may follow its various uses.

Blood and urine examinations must be complete, not just albumin and sugar. Inorganic and organic compounds must be determined and this of course depends upon the substance used. For example, a blood poison will increase the decomposed blood elements in the urine; aniline and phenolic compounds will increase the various organic radicals present; and the inorganic substances, for example, lead, arsenic, and chromium, will increase the substances in the urine.

Similar procedures must be followed in the blood, for besides the whites and reds, one has developed reticulocytes, change in platelets, basophils and various other pathological cells which are diagnostic.

In cases of dermatitis, the history, chemical findings and the patch test are diagnostic. In many substances the chemical structure and physical properties give a clue as to what to expect in the human or animal structure. I have made an effort to show how a correct diagnosis can be made, whether by the industrial physician or the man in general practice. The complications that are present in industrial diagnosis require cooperation and consultation among all physicians doing this type of work. While there are some minor differences, I believe these can be corrected if all those doing any industrial medicine will work harmoniously together for the good of the patient. A general conference of industrial physicians and physicians doing private practice could, I believe, establish a standard procedure for diagnosis which would be acceptable to all: to physicians, state industrial commissions, insurance carriers and industry.

THE TREATMENT OF TENDON INJURIES*

By S. Benjamin Fowler, M.D.,
Don L. Eyler, M.D.
and
George K. Carpenter, M.D.
Nashville, Tennessee

If we are to achieve good functional results in tendon injuries a more subtle and profound consideration must be given this tissue. Tendons must be afforded the same consideration given their companion structures, such as, blood vessels, bone and skin. We must familiarize ourselves with their anatomy, physiology and function and learn something of the tendon's varying behavior in special environmental situations.

Anatomy and Physiology.—The behavior of a tendon in response to trauma or disease depends largely on its environment. There are two types of enveloping membranes which surround tendons and which function to provide nutrition, a gliding surface and restraint. This enveloping membrane may be a synovial sheath or paratenon.

The synovial sheath is a special adaptation which allows the tendon to go around a corner with as complete efficiency as possible. It is a very close-fitting, gliding assembly. The synovial sheath consists of a tough fibro-osseous canal which contains a small amount of fluid, and the tendon with its visceral and parietal paratenon and its mesotendon. This mesotendon is thickened in the digits where it is familiarly called vincula. Synovial sheaths exist only in the hand and in the foot with two exceptions, and these are in the long head of the biceps at the shoulder and the popliteus tendon at the knee. In all other locations tendons are surrounded by paratenon.

Paratenon consists of an outer coat of fibrous connective tissue which varies consid-

---

*Read in Section on Orthopedic and Traumatic Surgery, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

erably in thickness and an inner filler of loose fibro-areolar tissue which completely surrounds the tendon and occupies the space between the tendon and the fibrous connective tissue envelope. This fibro-areolar tissue provides nourishment to the tendon and forms an excellent gliding mechanism. No fluid is present such as exists within a synovial sheath.

The tendon itself, when removed from its enveloping membrane, is not as homogenous as it looks. The periphery of the tendon consists of undifferentiated fibrous connective tissue which has a demonstrable blood supply and is physiologically active. The central portion of the tendon is completely inert and is avascular but it provides strength. In certain locations tendons contain sesamoids within or partly within their substance to increase their mechanical advantage. They may also develop abnormal bulbous enlargements in response to stress, perhaps much as a sesamoid is formed, which is the pathological physiology behind the snapping finger.

The synovial sheath has the physiology of a joint, and within its sheath all fibroplasia is ordinarily suppressed. On the other hand, tendon surrounded by paratenon has a remarkable fibroplastic activity.

Response of a Tendon to Injury.—The synovial sheath has the physiology of a joint and thus its normal physiological action is to suppress all fibroplasia. This is a protective mechanism which may, however, be lost due to infection or due to severe trauma, in which case fibroplasia can and does occur. Ordinarily, however, when a tendon is severed within its sheath it retracts, smooths over on the end and lies inertly. It looks about the same at the end of one week as it does at the end of ten years following injury.

When a tendon surrounded by paratenon is severed, a remarkable degree of fibroplasia takes place. There is a proliferation of fibroblasts from the periphery of the cut end of the tendon which reach out in a vigorous and energetic fashion in an attempt to re-attach the severed tendon ends. The ability of a tendon severed in paratenon to effect functional anastomosis is very considerable and there are certain instances within the body where nature can perhaps do a more effective job of tendon anastomosis than can the surgeon. If the wound has been cleanly incised and there has not been much disorder in the tissues immediately about the tendon, then nature can effect a most satisfactory anastomosis. The immature fibrous connective tissue finds its way down the fibrous connective tissue tunnel of the paratenon and re-unites with its other half. During the maturation of this healing process the immature fibrous connective tissue shrinks to a very considerable degree, thus drawing the tendonous ends closer together, and during that period of time the muscle makes an adaptive shortening and the patient may be left with a very effective muscle-tendon unit.

It is interesting to consider just what takes place when tendon ruptures. Ordinarily a tendon does not rupture, and when a break in the musculotendenous unit takes place this fracture occurs at the junction of tendon to bone or muscle to tendon, and this is universally true in all instances where tendon surrounded by paratenon is involved in a rupture. The only circumstance in which a tendon could be expected to rupture occurs in tendons which lie within synovial sheaths. Here a tendon may gradually attenuate due to repeated minor traumata, or it may be partially severed or crushed in such a manner as to cause a partial fracture. Within the synovial sheath there can be no fibroplasia, and therefore, no healing of this partial defect in the tendon, so it may under moderate stress completely fracture at this weakened point. The two tendons which exhibit spontaneous rupture to the greatest degree are the extensor pollicis longus and the long head of the biceps, both of which are quite subject to injury.

When cut tendons are approximated and the environment is suitable, repair takes place effectively in about three weeks, although final maturation of the healing process is not present for a considerable additional time. The healing first consists of a peripheral fibroblastic splint or callus, which is rapidly laid down around tendon ends. A considerable enlargement is therefore caused both due to the callus and the reactive edema in the tendon itself with a marked increase in local bulk of perhaps as much as three

hundred per cent. The central ninety-five per cent of the tendon remains completely inert during the healing process except for edema, and it actually undergoes necrosis. It is invaded from the periphery by the fibroblasts to complete the anastomosis late in the stage of repair and as the tendon callus matures, the tendon ideally shrinks to its normal size.

The surface layer ot the tendon is extremely important and its treatment will determine the success of our tenorraphy. If the suture holds the tendon ends in a reasonably accurate approximation, aided by splinting, then union will occur. However, if union occurs, our tenorraphy will be a failure unless the tendon is able to glide a certain minimum distance. Often function may be more impaired from a limitation of gliding action than it would be if the tendon actually were left completely divided.

If tissues about the tendon are significantly damaged by injury or the surgeon, or by infection, then tenorraphy can only be a failure and would have been better left undone.

If the surrounding tissues are in excellent condition we shall still fail if the surface of the tendon is injured by the trauma of dehydration or manipulation, or if our suture material causes excessive foreign body reaction. In spite of claims of inertness of all suture material, none possesses it absolutely. It is the mechanical irritation that is most important where a tendon is concerned and a suture in the periphery of the tendon causes considerable local fibrosis because it is in the active substance of the tendon, and nature attempts to encapsulate this suture material with increased fibrous connective tissue activity. This impairs the gliding mechanism of the tendon and increases the degree of adhesions. It is, therefore, recommended that end-to-end tenorraphy be done by the technic prescribed by Dr. Bunnell, when a single strand of suture material is used which resolves itself into the core of the tendon and is thus unable to cause or perpetuate any irritative reaction.

Our problem is obviously magnified when we attempt to repair a tendon within a synovial sheath and there are many factors which contribute to failure of tenorraphy in this situation. In the first place, the enlargement which takes place at the site of a tendon anastomosis is too great to be accommodated within a tight fibro-osseous canal. This means that circulation is impaired and necrosis takes place at the periphery of the tendon, with the result that there is a blending of all tissues in this vicinity and a complete loss of identity of the tendon amidst its surrounding tissues. This leaves a complete tenodesis. We further have the theoretical problem previously mentioned of a suppression of fibroplasia by the physiology of the synovial sheath. This is a real problem but I feel confident that the trauma inflicted by the surgeon is generally sufficient to reverse the physiology of the synovia. Successful repair of a tendon within a sheath is possible to a limited degree. It can be obtained if a considerable portion of the sheath at the site of the tendon anastomosis is sacrificed, or it can be successfully done if we do not require much excursion in the tendon at the site of the anastomosis. The greater the amount of sheath that is sacrificed, the greater the excursion which we may expect to obtain at this site, but if a considerable portion of sheath is lost in certain areas, marked bow stringing of the tendon will result and cause a flexion deformity. Instances where tendon repair in synovial sheath is most favorable exist in the flexor sheath to the little finger in the proximal two-thirds of the palm of the hand where the sheath can be removed without resultant disability. Where the flexor digitorum profundus tendon is lacerated distal to the insertion of the flexor sublimus tendon, it can generally be satisfactorily repaired because here we do not need much excursion at the site of the anastomosis and a considerable portion of the sheath in the vicinity of the anastomosis may be sacrificed without danger. Certainly, it is true that primary repair of tendons divided within a synovial sheath is sometimes indicated; however, in the majority of cases tendons divided in such a location are better left unsutured and repair may be effected later with a free tendon graft or a tendon transplant.

The Management of Tendon Injuries.—So much emphasis has been placed on the various technics of tendon repair that the reader

is apt to get an erroneous impression of the subtleties of the management of tendon injuries. It would seem that the whole problem was down to the fact that if the danger of infection does not contra-indicate tendon repair and the tendon has not been severed in a restricted area, such as has been emphasized by Dr. Bunnell, then, primary tendon anastomosis should be done. Otherwise, we should close the wound and later do a tendon graft or perhaps a delayed tendon suture under certain circumstances. This is a great oversimplification of the problem.

There are tendons which, if severed, do not need repair under any circumstances, either because they have no worthwhile function or because nature can repair them perhaps better than the surgeon. These worthless tendons would include the palmaris longus and the plantaris. The palmaris longus should never be repaired; it merely causes increased local fibrosis and it has no worthwhile function. The plantaris is even more insignificant. The long toe extensors, too, are not functionally very important. If they are sutured and the excursion of the tendon is limited because of adhesions at the suture site, then a hammer toe deformity will result. If left alone, however, and unrepaired, there will be no functional disability and in all probability the tendons will repair themselves very rapidly. The only way you can get a disability from severed toe extensors is to attempt their repair surgically. It is well-known that the ability of the extensor hallucis longus tendon to repair itself is so great that the Jones suspension is a poor operation.

Tendons of secondary importance should not be sutured where their repair might compromise the repair of more important tendons. In a lacerated wound of the wrist with division of all tendons plus the median and ulnar nerve, the structures of primary importance are the nerves, the flexor pollicis longus and the flexor digitorum profundus tendons. Here, we can consider that the sublimi and the wrist flexors are of secondary importance. If all twelve tendons and both nerves were sutured over the volar aspect of the wrist in that small confined space, nothing but a great homogenous mass of scar tissue would result with no functional activity on the part of any tendon or nerve. The flexor digitorum sublimus tendon should seldom, if ever, be repaired in any event. Gravity will provide some wrist flexion and the flexor carpi ulnaris and flexor carpi radialis are tendons in paratenon and will generally unite themselves in a functional manner. On the dorsum of the wrist, if all structures are divided, a somewhat different problem ensues, in that here extension of the wrist is of primary importance, and extension of the fingers is secondary. Abduction of the thumb is likewise of primary importance, whereas, extension of the thumb is secondary. In this case, the first thought must be given to providing good extension of the wrist and abduction to the thumb. The extensor carpi radialis brevis is the most important extensor muscle of the wrist, although the other wrist extensors should be repaired if at all possible. Extension of the fingers and thumb can later be restored, or can be given a simple mass extension action by providing one or two motors to power the extension. Actually gravity aids greatly in extending the fingers, and often a functional tenodesis will give a result which is surprisingly good. Certainly on the dorsum of the wrist you would not attempt to repair every severed tendon, in the event that all were severed, but would in a wound of this nature provide the patient with his basic needs insofar as possible, and accept the fact that in these severe injuries we have to simplify the mechanical unit with which we deal and to eliminate as many parts as possible, or else none of our parts will move.

When we consider the foot and ankle we must give first consideration to the tendocalcaneus and no other tendon injury about the foot and ankle should have any attempt at repair if such a repair might compromise the suceessful suture of the tendocalcaneus. The anterior tibial tendon is next in importance, although its action can be partially substituted for by the long toe extensors. The posterior tibial tendon is quite important in growing children, as are the peroneal tendons, but these lateral stabilizers take places of secondary importance, and even if their function were completely eradicated and no repair were possible, their function could be substituted for by tendon transfers or by an arthrodesis, although certainly repair of a tendon is much preferable.

There are other tendons which are not functionally important enough to warrant any added damage to local tissues. This is well illustrated by the toe flexors which are not functionally very important and certainly would not indicate that we extend any wound on the weight bearing tissues of the forefoot in order to attempt repair. The flexor pollicis longus, however, is somewhat more important and its repair should be done if feasible. When the flexor digitorum profundus tendon to a digit is severed and yet the sublimus tendon is intact, we are faced with a similar situation, and unless the conditions are ideal in all respects, I should not advocate that the profundus tendon be sutured, and certainly it should not be done except as a primary procedure.

Other than anastomosis of tendon there are other methods of treatment which are occasionally indicated. Tendon transfer is preferable to tendon anastomosis in certain instances because its technic is simpler and the results are better. This is particularly well shown in ruptures of the long head of the biceps. Repair here is difficult, but it is simple to re-attach the distal end of the tendon to the shaft of the humerus or to the short head of the biceps at its approximate normal tension. It is also considerably easier to treat division of the extensor pollicis longus within its sheath by transfer of the extensor indicis proprius. Tendons of short excursion which are surrounded by paratenon are often best treated by splinting of the joint in a position calculated to allow maximum relaxation of the severed tendon. An excellent example of this occurs in rupture of the central extensor tendon to the distal segment of a phalanx. It should always be kept in mind that if tenorraphy is not advisable because of conditions of the wound, particularly when a tendon is surrounded by paratenon, a good functional result may be often obtained by splinting the affected part in a manner designed to provide the most relaxation and most closely to approximate the origin of the insertion of the tendon. Even lacerations of the tendocalcaneus and other tendons of considerable excursion may be treated in a highly satisfactory manner by this technic, and often yield superior functional results.

CONCLUSIONS

(1) Familiarity with the behavior of a tendon under different environmental conditions is necessary for the successful treatment of tendon injuries.

(2) Tendon anastomosis must be carefully done with particular regard for the surface of the tendon.

(3) Certain tendons should seldom, if ever, be repaired.

(4) Tendons of secondary importance should not be repaired in complex wounds.

DISCUSSION *(Abstract)*

Dr. E. W. Cullipher, Miami, Fla.—Bunnell divides the process of tendon healing into four weeks. The first week is the fibroblastic splint which is mentioned by the authors which consists of a transluscent jelly like substance joining the two tendon ends and in addition to the edema mentioned there is considerable increase in the vascularity. There is, of course, no strength to this union. The second week is the week of connective tissue proliferation, at which time the swelling usually reaches its maximum and the in-growth of connective tissue and tendon fibers becomes apparent. Fusiform mass at this time is continuous with the surrounding tissue. The third week is one of production of tendon collagen fibers which have at that time formed across the gap of the two tendon ends. The edema and increased vascularity is now beginning to subside and there is beginning cleavage of the tendon from the surrounding tissue to allow some motion. The fourth week is that of resolution, in which the swelling and vascularity decrease and the tendon becomes more loosened from the surrounding tissues so that some gliding motion is possible. At the end of this week strength is good at the junction of the two tendon ends although not entirely normal. The process in paratenon takes place much faster than in the sheath but is essentially the same except that proliferation of the paratenon itself adds to the rapidity and strength of the healing.

I am in most hearty agreement with the statement that one can easily get an erroneous opinion as to the simplicity of management of tendon injuries. I am sure we have all observed, or perhaps even experienced, the tragedy of multiple tendon repair in the wrist which has apparently been done well technically but which ends up in a poor result. It is usually most difficult for the surgeon to leave any tendon unsutured. However, we are primarily interested in the functional end result of the individual case. It cannot be emphasized too strongly that the primary tendons must have first concern and attention and that secondary tendons must be left unsutured if there is any possibility at all of making the primary suture unsuccessful. This is, of course, typically true of the flexor digitorum sublimus and its relation to the flexor digitorum profundus in the fingers. A finger will function very well without the sublimus

when it is found necessary to sacrifice this tendon. The palmaris, plantaris, and the toe extensors are, of course, of no importance.

POLYRADICULOPATHY IN MAN PRODUCED BY ST. LOUIS ENCEPHALITIS VIRUS (SLE)*

By MURRAY SANDERS, M.D.†
ALFRED BLUMBERG, M.D.†
Coral Gables, Florida
and
WEBB HAYMAKER, M.D.‡
Washington, District of Columbia

The annual morbidity statistics of the United States and other countries include figures on acute neurological disorders referred to in the medical literature under a variety of noncommittal terms such as encephalopathy, meningismus, Landry's ascending paralysis, infectious polyneuritis, and Guillain-Barré syndrome. The underlying cause of the conditions has been discussed by a number of authors whose evidence has been inferential rather than direct.

In reporting the following case, we are aware that the clinical syndrome and the morbid changes are not in keeping with the classical descriptions of St. Louis encephalitis virus. Yet a virus of St. Louis encephalitis was isolated from the patient under our care. The fact that neither the clinical manifestations nor the pathologic features presented an unqualifiedly classical picture of encephalitis is of particular interest, inasmuch as it leaves the impression that the end result of a virus-produced condition is not the same in every instance. Furthermore, this case introduces the question as to whether sporadic cases with divergent manifestations are produced by a virus which passes from host to host, maintaining an endemic existence during which the clinical manifestations are milder than those under epidemic conditions. It is perhaps this difference in manifestation which has created the erroneous impression that the St. Louis encephalitis type of virus is not to be found in the extreme southeastern areas of the United States, including Florida. With the numerous available avenues for the introduction of any infectious agent into the Miami area, a center of international communication by plane, sea, rail, truck and motor car, it is understandable that the St. Louis encephalitis virus might have been introduced and taken hold, although not in the recognized epidemic form.

The following case history is lacking in some details which were not available to us.

Clinical History.—A 30-year-old white man, employed as a service station attendant, had had a sore throat and fever that presumably reached 104° two weeks before he was admitted to the Veterans Administration Hospital, Coral Gables, Florida. Although his physician treated him with aureomycin the condition became aggravated, with increasingly severe headaches, difficulty in swallowing, and numbness of the hands and feet. Later the fever subsided and was succeeded by vomiting and diarrhea.

Upon admission to the hospital he no longer complained of difficulty in swallowing or of numbness. Headache, weakness, and inability to walk were his chief symptoms.

The patient had been a steel worker before he entered the Army and most of his life had been spent in the Midwest. Part of his Army service (12 months) was in the European Theatre of Operations. After separation from the Army he became a resident of Miami where he lived for the three years preceding this illness.

Physical Examination.—The patient was well developed, 175 cm. tall, and weighed 77 kg. His temperature was 98.6°F., pulse rate 80, and blood pressure 120/70. The examination was entirely negative, except for neurological disorders.

Sensory examination of the head and neck revealed no abnormalities. Cranial nerves 1 to 12 were intact. Since the patient was unable to stand, the Romberg test could not be performed, nor was it possible to observe his gait.

The muscle power of the upper extremities was greatly diminished bilaterally. There was no suggestion of muscular atrophy and no fasciculations, tremors, or fibrillations. The patellar and ankle reflexes were absent, and the Babinski and Hoffmann reflexes could not be elicited. Sensory examination of the upper and lower extremities revealed glove and stock-

---

*Read in Section on Pathology, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

*Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the authors are the result of their own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

*The authors wish to express their sincere thanks to Drs. F. S. Cheever, I. Ruchman and M. Schaeffer for their cooperation in providing the St. Louis encephalitis antiserum, and to Dr. Alvin M. Getz, Veterans Administration Hospital, Coral Gables, Florida, who supplied them with the history and physical findings of the patient.

*The laboratory investigation concerned with isolation procedures was supported in part by the Damon Runyon Memorial Fund and the Mary Schuck Smith Fund.

†Veterans Administration and Department of Microbiology, University of Miami, Coral Gables, Florida.

‡Armed Forces Institute of Pathology, Washington, D. C.

ing anesthesia. Vibratory sense was intact in all tested areas.

Laboratory Findings.—The urine had a specific gravity of 1.025; it was negative for both albumin and sugar. A few calcium oxalate crystals, occasional squamous epithelial cells, and 1 to 4 erythrocytes were seen in each high power field. The Kahn test was negative. The total leukocyte count was 17,200, of which 88 per cent were polymorphonuclear leukocytes, 2 per cent monocytes, and 10 per cent lymphocytes. Hemoglobin was 15 gm. Cerebrospinal fluid was not obtained.

Course.—For 48 hours the patient's condition remained stationary. On the third day difficulty in swallowing suddenly developed and he became covered with cold perspiration. Two hours later he collapsed, respiration and pulse were imperceptible, and soon afterward he died.

Post Mortem Study.—The autopsy was performed 13 hours later. The outstanding macroscopic findings were those of bronchopneumonia and pulmonary edema, generalized passive congestion, and edema of the cerebrum and cerebellum associated with minute hemorrhages in the cerebrum, cerebellum, and pons. There was engorgement of the vessels of the cerebrum and the choroid plexuses, the latter to such a degree as to appear almost black. In the spinal cord the gray matter was a light coffee brown and the outline of the anterior horns was blurred. Part of the medulla oblongata taken for virus studies was promptly removed aseptically and quickly frozen in a mixture of acetone and carbon dioxide ice and then stored at -30°C. for 13 days.

Microscopically, the brain presented the picture of moderate encephalopathy. Clear evidence of encephalitis was lacking. The meninges contained scattered reactive histiocytes and occasional tiny hemorrhages and the meningeal vessels were distended and engorged. Minute hemorrhages were also encountered in the cortex and the white matter, and hemorrhages of greater size were present in the cerebellum and pons. The severity of the edema in the cerebrum varied, and some areas were entirely free from edema. In areas of severe edema there were ischemic nerve cell changes characterized by amphophilic cytoplasm and shrinkage and basophilia of nuclei. These changes were particularly evident in the hippocampus and amygdala, perhaps as a result of retardation of venous flow caused by the edema of the base of the brain. Statellitosis was occasionally noticeable. Inflammatory cells were few. Here and there a small blood vessel contained an increased number of polymorphonuclear cells. A few hematogenous cells, both polymorphonuclear leukocytes and lymphocytes, were seen around vessels in the caudate nucleus and around a vessel adjacent to the hippocampal formation and in the pars basilaris pontis. Nowhere were they sufficient in number to warrant the diagnosis of encephalitis. In the cerebellum, regressive changes were present in a few Purkinje cells.

The anterior horn cells of the spinal cord and the cells in Clarke's column had undergone degeneration of varying degree.

The third, fourth, sixth, seventh and eighth nerves exhibited changes consistent with those of the Landry-Guillain-Barré syndrome. These changes varied from mild to moderate. Whether they were the result of aureomycin treatment remains an open question, but we seriously doubt that aureomycin is capable of producing such changes. Lesions were most conspicuous in the third, fourth, and seventh nerves. They consisted of minute focal areas of demyelination, in the midst of which were a few macrophages. Although in such foci the axis cylinders exhibited spotty loss of argentophilia, they were not disrupted. Hence the lesions were of the Gombault-Stransky type.

Examination of the nervous system of mice dying after injection of the virus isolated from the medulla oblongata of this patient revealed striking encephalitis which affected chiefly the caudate nucleus and the upper brain stem. Sections from the spinal cord, nerve roots and nerves of these mice presented nothing significant.

Cultures from the pulmonary exudate obtained during autopsy resulted in the growth of *Streptococcus viridans* and *Klebsiella pneumoniae.*

Tissue from the medulla oblongata was submitted to the VA-UM laboratory for virus study immediately after removal of the brain. Investigation of this material yielded a St. Louis encephalitis virus, or a closely related virus.

The technical details concerning the isolation of the virus have been presented by Sanders, Soret, and Akin.[1] A brief resumé follows:

A suspension of 1:5 medulla oblongata was prepared, with 10 per cent rabbit serum as the vehicle. The suspension was injected intracerebrally into 20 CFW mice of 14 to 16 grams. Four of the animals died as a result of trauma. In 10 of the remaining 16 mice symptoms attributable to central nervous system involvement were noted eight to nine days after the injection. Five of the mice had diffuse meningoencephalitis. In 3, conspicuous flaccid paralysis preceded the development of the meningoencephalitis, which appeared terminally. The brains and spinal cords of these animals revealed no bacteria, but a filterable agent was obtained in every instance. The agent was transmissible from mouse to mouse. The first sign of the disease appeared on the third day, which was in contrast to the eight to nine-day period of incubation noted in the original mouse passage. Subsequent mouse passages indicated stabilization of the incubation period, symptoms appearing within three days when a lower dilution was employed and after four or five days with the higher dilutions.

In the second mouse passage, flaccid paralysis was marked on the third day and considerable spastic paralysis was evident on the fourth day.

Since the second mouse passage it has been apparent that the infectious agent had a strong predilection for the central nervous system and was not bacterial in character. The ease with which suspensions were filtered through an E. K. Seitz filter pad and the lack of effect upon the potency of the agent when the suspension was centrifuged at 13,000 rpm. (Servall, Model PA5) suggested that the agent was a virus.

The specific nature of the agent was ultimately determined by neutralization tests with anti-St. Louis encephalitis serums obtained from three sources. Based on LD_{50} calculations, as much as 25,000 (no endpoint), 3,200 and 7,900 neutralizing doses were obtained against the anti-St. Louis encephalitis serums from the Universities of Cincinnati and Pittsburgh and from the U. S. Public Health Service. On the whole, these neutralizing indices were in agreement with those found at the laboratories from which the serums were received. From the neutralization results it will be noted that the virus titer has been fairly high and that LD_{50} titers of $10^{-6.5}$ have been obtained since the second mouse passage.

The samples of almost every mouse passage, including the current one (twelfth mouse passage), have been stored as a 1:5 brain emulsion in 50 per cent rabbit serum at -30°C. These passage samples are available for further investigation. It is significant that early in the present investigation the virus was sent to Drs. Cheever, Ruchman and Schaeffer, who reported (personal communication) that their findings are in agreement with ours and that they consider this agent either St. Louis encephalitis or a closely related virus.

Another test by Dr. W. McD. Hammon gave a strong indication (in the direction of the test) that the Miami virus differed little, if at all, from a classical (Webster) strain of SLE. Dr. Hammon has reported (personal communication) that he challenged a group of mice immunized against the Webster strain of SLE with both the Miami virus and the homologous, Webster strain. The immunized mice were equally resistant to the Miami and Webster viruses.

The host range of the virus was readily determined by intracerebral, intraocular and intratesticular injection of mouse brain emulsions into rats, rabbits, and guinea pigs. The failure of the virus to produce infection in any of these experimental hosts other than the CFW mice (intracerebral route only) was consistent with the neutralization results which placed it in the St. Louis encephalitis virus group. Microscopic examination of the mouse brains disclosed pathologic changes similar to those noted in the brain of our patient.

In view of the aberrant symptomatology and unusual post mortem findings in relation to the agent isolated in Miami, one fact is of further interest. Since the establishment of the present Department of Microbiology, where the isolation procedures were carried out, there has been no St. Louis encephalitis or related virus (for example, epidemic keratoconjunctivitis, West Nile, and so on) either handled or stored in the laboratory.

DISCUSSION

The isolation of the St. Louis encephalitis virus in the southeastern area of Florida may be surprising in view of the current concept of the habitat of the virus.

Although this virus has been regarded as restricted to central and western parts of the United States, such geographical limitations may have been due to oversight since it is not known to what extent manifestations similar to those described in this patient may have occurred in others.

As pointed out, with modern transportation facilities, numerous avenues are open to the introduction of St. Louis virus or any other disease agent into the Miami area. It is not our purpose to delve into this phase of epidemiology. Our purpose is to emphasize the advisability of investigating the various acute neurological disorders of unknown etiology in an effort to determine whether they are virus infections.

SUMMARY AND CONCLUSION

(1) A strain of St. Louis encephalitis virus has been isolated for the first time in southeastern Florida.

(2) The virus was obtained from the brain of a man who did not have the classical symptoms of encephalitis, nor did the pathologic findings conform with those described in the classical forms of epidemic St. Louis encephalitis; in fact, the cranial nerve changes most closely resembled those of the Landry-Guillain-Barré syndrome.

(3) The brains of the mice inoculated with the virus-containing material presented the picture of encephalitis.

(4) Clinical and research attention should be focussed on acute neurological disorders of unknown etiology without regard to their supposed geographical limitations.

BIBLIOGRAPHY

1. Sanders, Murray; Soret, Manuel G.; and Akin, Benjamin A.: Presented at the annual meeting of Society American Bacteriologists, Boston, April 28, 1952.

DISCUSSION *(Abstract)*

Dr. Albert E. Casey, Birmingham, Ala.—May I ask whether you had serum from the patients to do complement fixation; also whether you had spinal fluid which had protein determination, or any other protein levels?

Dr. Alfred Blumberg, Coral Gables, Fla.—The laboratory work performed consisted of a blood count, Kahn test and urine analysis. No spinal fluid was obtained for examination. When this patient originally consulted a physician his complaint, sore throat, hardly indicated the need for a spinal fluid examination. After his admission to the hospital no opportunity for elaborate laboratory examinations existed due to his early and unexpected demise.

RECURRENT HENOCH-SCHONLEIN PURPURA*

By ARTHUR M. FREEMAN, M.D.
Birmingham, Alabama

For many years before the publications of Henoch[5] clinicians were aware of the association of purpura with abdominal cramps, melena and arthralgia. This constellation of skin, joint and visceral lesions was of great interest to Osler[8] who recognized them in 1885 and speculated upon their significance at greater length in 1914. Since that time Henoch-Schonlein purpura has generally been accepted as a phase of the so-called rheumatic state. More recently considerable attention has been directed toward the ground substance of the body, collagen, and the several patterns of disturbance of this tissue mass which are manifested by serum sickness, asthma, polyarteritis, rheumatic fever and lupus erythematosus desiminatus to name but a few. Parallel with this emphasis placed upon diffuse collagen diseases by pathologists there have been developments in the therapeutic field that at times exert potent and beneficial effect on diseases so classified. Under our present concept of the pathogenesis of allergic purpura with its visceral concomitants we felt obligated to apply agents occasionally temporarily useful in the clinical management of related disorders. Our report discusses extensive observations with ACTH and cortisone in two cases with the very considerable ancillary problems of differential diagnosis and total management.

Case 1.—WDB, a twelve-year-old white girl had been ill for three months with onset one month after normal menarche of bloody diarrhea, fever, and abdominal cramps. She was hospitalized and amebic colitis was diagnosed on stool findings. Emetine and milibis® were given in appropriate dosage with only temporary relief. She had recurrence of the bloody diarrhea and continuation of the anorexia, vomiting, weight loss and fever. Subsequently, in January, she was hospitalized at another hospital with the diagnosis of nonspecific ulcerative colitis. Antibiotics and very small amounts of cortisone were given without relief. She continued to go downhill and was admitted on January 23, 1952, to St. Vincent's Hospital. Initial examination revealed her to be a very cachectic girl somewhat more mature in appearance than twelve years. Her appearance was delicate. She was very dependent upon her mother. The skin and glands were normal; the blood pressure was 90/60; temperature, 99° F.; the mucous membranes, eyes, ears, nose and throat were normal. The lungs were clear and, except for a Grade I systolic basilar murmur, the heart was normal. The abdomen was flat but diffusely tender. No mass was present initially. Rectal examination was normal and sigmoidoscopic view of the lower twenty centimeters of the colon revealed normal findings except for small areas of redness not immediately recognized as purpuric. The extremities were matchstick in their emaciation. The fingers were long and faintly clubbed. There were no bruises nor joint swelling. A neurologic survey was normal.

Laboratory studies revealed a red blood count of 3.65 million with 9 grams of hemoglobin, 9,250 leukocyte count with 37 per cent lymphocytes, 61 per cent polymorphonuclears, 1 per cent monocytes and a total eosinophil count of 67 per cu. mm. Urinalysis of a catheterized specimen showed yellow color, acid reaction with 1.022 specific gravity, 80 milligrams per cent albumin, negative for sugar. Innumerable red cells and several white blood cells were noted in the uncentrifuged specimen. The urine culture was positive for streptococcus fecalis. The non-protein nitrogen was 29 milligrams per cent. Carbon dioxide was 57 volumes per cent; chlorides, 437 milligrams per cent. Serum protein totaled 7.2 grams per cent with 3.7 grams of albumin and 3.5 grams of globulin per hundred ccs. Coagulation, bleeding and prothrombin determinations were normal. The stools were positive for blood but negative for ova and parasites. A tuberculin test was negative. X-ray studies of the upper gastrointestinal tract and the small bowel were negative; similarly, initial barium enema films including the terminal ileum were normal. The chest x-ray was negative.

Course in the Hospital.—Symptomatic medication and fluid restoration were accomplished during the first few days when diagnostic procedures were in progress. On the third hospital day a rash of purpuric spots broke out over the entire body particularly the palms, pretibial regions and abdomen. Mucosal surfaces seemed spared and the optic fundi showed no hemorrhage. Recognizing a hematologic deficit appropriate studies were made. The platelet count was normal on several occasions averaging 150,000 to 180,000 per cubic millimeter by the Dameshek method. The spleen was never palpable. Liver function studies were normal including absence of retention of bromsulfalein in 5-milligram per kilogram dosage after forty-five minutes. The bone marrow was normal. The peripheral blood was normal except for persistent hypochromic anemia which was corrected from time to time with the liberal replacement of whole blood. Two negative LE cell preparations were reported by the hematology department of the Medical College of Alabama.

Bruised areas appeared over the knees and other joints. The diagnosis of allergic purpura was apparent. The patient gave no history of drug sensitivity, previous allergic disease or rheumatic fever; there was a suggestive but not clear cut family history of asthma and food sensitivity.

*Read in Section on Gastroenterology, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

The patient was placed on ACTH in 80 milligram dosage per day. Careful daily checks of the patient's symptoms and findings were made in order to determine the efficacy of the drug. There was temporary improvement subjectively and a drop from 68 to zero in the eosinophil count. Daily urinalyses showed only minor variations in amount of albumin and in red cells. The appetite temporarily improved. ACTH was continued from February 25, 1952, through March 9, 1952, with no substantial betterment; in fact she underwent initial improvement and then suffered recrudescence of fever, vomiting, diarrhea, cramps and showers of purpura while under therapy. Toward the latter days of ACTH therapy other measures were required: protein supplements, whole blood, antibiotics and symptomatic care.

Insulin was given before meals for the purpose of stimulating the appetite although symptoms of hypoglycemia necessitated its discontinuance.

On March 9, a mass appeared in the right side during an exacerbation of abdominal cramps and vomiting. Intussusception was suspected and a barium enema given under fluoroscopic control. This maneuver promptly relieved the pain, whether by reduction of the intussusception or by bland separation of acutely inflamed and spastic bowel layers cannot be stated. The film showed spasm of the ascending colon suggestive of mucosal destruction and compatible with regional ascending colitis. Symptoms recurred which forced the decision to explore the patient on March 12, 1952. At this time petechiae were seen in the small bowel but no evidence of ileitis or frank ulceration was noted. Smooth postoperative recovery occurred although after a few days there were recurrences of the abdominal pain and purpura.

During these attacks there was no relief achieved by the use of either epinephrine or chlortrimeton.® An exclusion diet of the Rowe type was attempted but the patient could not always tolerate it. On the occasions when she broke away from the prescribed foods invariably a recrudescence of symptoms resulted. Attempts were made to feed this patient through an indwelling nasal gastric tube employing only amino acids and polypeptides in a solution supplied through the courtesy of Dr. Elliott[3] of Miami. No success can be reported from this. Nausea and diarrhea forced us to abandon this approach. A progressive Rowe diet seemed finally to be associated with longer remissions. The ingestion of chocolate, coca cola, pork and wheat each in more than one instance was followed by a flare-up of symptoms within a few hours. The patient was discharged May 31, 1952, after being under hospital observation for more than three months. At the time of discharge she had been free of symptoms other than dependent edema and pretibial purpura for more than two weeks and had gained from sixty-four to seventy-six pounds. The urine, non-protein nitrogen and phenolsulfonephthalein tests were normal at the time of discharge. Her second menstrual period, apparently normal, occurred in April. During the summer she had a few minor disturbances always associated with dietary transgression. She was last seen in October of this year, normally developed, free of all symptoms, weighing ninety-one pounds, with normal urinary findings.

Case 2.—MJB, an eight-year-old white girl entered Jefferson Hospital December 3, 1950, having been ill six days with fever, and increasingly severe, crampy, abdominal pain. Purpuric spots had been noted six days before. She presented the signs of an acute abdomen at the time of admission. Surgical exploration revealed a gangrenous loop of ileum intussuscepted into itself. Resection was performed and the operation was attended with some evidence of lower extremity phlebothrombosis and pneumonitis suggesting thrombo-embolization of the lungs. Anticoagulants were given and the course became smooth. Ten days postoperatively she underwent recurrence of skin rash and abdominal cramps simulating the initial attack. Cortisone was given, anticoagulants being discontinued. A total of twelve hundred milligrams of cortisone were given over a six-day period with attendant suppression of the hemorrhagic episode. The patient was discharged two days later after a brief course of ACTH. Studies in this instance were made to exclude other forms of diffuse collagen disease, substance bacterial endocarditis and a primary hematologic deficit.

She was discharged on December 23, 1950, and was rechecked in May of 1951, at which time she was entirely normal with a negative urinalysis. She was somewhat emotionally overdependent on her mother in a manner reminiscent of our first patient.

From our experience and from similar reported observations I have formed some tentative convictions about this disease.

The differential diagnosis may be difficult. This syndrome has been reported to occur in a wide variety of disease states including the collagen diseases, brucellosis, cirrhosis of the liver, typhoid, tuberculosis, and lymphomata. One is required to exclude the specific and non-specific ulcerative colitides. The operative question with respect to intussusception is of overwhelming importance and always requires close observation and cooperation between surgeon, radiologist and internist.

The renal status of the patient must be under constant surveillance especially if vomiting or diarrhea vitiates the electrolyte balance or if steroid therapy distorts ionic equilibrium. The necessity of blood replacement in the face of hematuria alerts one to the likelihood of resultant renal injury. Some twenty per cent of the cases of allergic purpura are reported to progress to chronic glomerulonephritis.

ACTH and cortisone are dangerous and probably worthless. They should be used only in the face of rapid deterioration of the patient and then only under close observation. Dameshek[2] reports one well documented case and Wooley[10] two cases to support this view.

Despite Keenan's[7] conclusion in one case to the contrary the value of antihistamic drugs is negligible.

Antibiotics appear to be of no value. The use of penicillin may be theoretically justified in instances in which the patient harbors a susceptible organism such as hemolytic Streptococcus.

Nutritional restoration is paramount in many cases, and poses a paradoxical situation. Our first patient was cachetic with an overwhelming protein requirement yet a variety of protein foods so necessary for her rehabilitation were apt to precipitate an attack of skin and bowel purpura. One would think that Dr. Elliott's[3] amino acid preparation which proves useful in other states of protein deficit would constitute ideal precision therapy here; unfortunately we were unsuccessful in its application despite the use of a very slow intragastric technique in accordance with his directions.

I think that if such a dilemma confronts me again I will try the polypeptide infusion once more. Insulin was ineffective in combatting anorexia.

We relied on the trial and error progress diet outlined by Rowe and achieved gradual success. We did not attempt skin testing although this may be of value in some cases. Nor did we try the leukopenic[1] or thrombopenic index.[6,9] Giacomo[4] suggests that these tests are often not applicable and in our instances they appeared impracticable.

SUMMARY

Two cases of allergic non-thrombopenic purpura with visceral complications are presented as a study in some of the dilemmas of diagnosis and management that arise. The most significant observation related to the ineffectiveness of both ACTH and cortisone in reversing the trend in one patient and its doubtful role in the second case. Attention was called to the surgical significance of the disease and to the difficulties encountered in feeding patients with reference to the contrastingly great need for protein itself and to the dangerous effects of such food when the patient is sensitive to it.

BIBLIOGRAPHY

1. Coca, A. F.: Familial Nonreagenic Food Allergy. Edition 2. Springfield: Charles C. Thomas, Publisher, 1945.
2. Dameshek, William: The Therapeutic Effect of Pituitary Adrenocorticotrophic Hormone (ACTH) in a Case of Henoch-Schonlein Vascular Anaphylactoid Purpura J.A.M.A., **144**:1372-1374 (December 16), 1950.
3. Elliott, John: Personal communication.
4. Giacomo, R., *et al.*: Purpura Due to Food Sensitivity. Use of Skin Testing in Etiologic Diagnosis. J. of Allergy, **22**: 487-493 (Nov.), 1951.
5. Henoch, W.: Klinische Wochenschrift. **11**:641, 1874.
6. Hampton. S. F.: Henoch's Purpura Based on Food Allergy; Report of Two Cases. J. Allergy, **12**: 579-591.
7. Keenan, W. S.: Lahey Clinical Bulletin, **7**: 54-56, (Oct.), 1950.
8. Osler, W.: Visceral Lesions of Purpura and Allied Disorders. Brit. Med. J. **1**: 717, 1914.
9. Squier, T. L.: and Madison, R. W.: Thrombocytopenic Purpura Due to Food Allergy. J. Allergy, **8**:143, 1937.
10. Wooley, E. J. S.: A Case of Schonlein Henoch Purpura Treated with ACTH. Brit. Med. J. **1**: 259 (Feb. 2), 1952.

DISCUSSION *(Abstract)*

Dr. C. Raymond Arp, Atlanta, Ga.— While this syndrome is not seen very frequently, it is probably one of the somewhat unusual conditions that are often overlooked. Derham and Rogerson reported 35 cases occurring between 1944 and 1950. Gairdner reported 18 cases, and these 53 cases represent a majority of the cases reported in recent years. The rest of us must be seeing them from time to time.

In the earlier case reports of Osler and others, there are cases of various types of purpura which do not belong in the classification of Henoch-Schonlein's purpura, in the opinion of Gairdner who studied 107 of them. He defines this syndrome as an exanthem which can be identified by histologic study of skin biopsy accompanied by gastro-intestinal symptoms of colic, vomiting and hemorrhage and by joint symptoms of pain and swelling.

In studying the recent literature, I have found 76 cases reported.

It is felt by Gairdner and most other observers that this syndrome is related to allergy and that sensitization to bacteria or their products and less frequently to food or other allergens is the basic cause. In 66 cases reported a bacterial background was determined in 66 per cent, food allergy in 9 per cent, diphtheria-tetanus vaccine in 1.5 per cent (one case), ivyol® inoculation in 1.5 per cent (one case). The probable cause was unknown in 30 per cent.

Throat cultures were done in 49 reported cases. A positive culture of streptococcus hemolyticus was found before, during or after an attack in 30. A history of sore throat before or during the attack was common.

Because of the relationship to allergy in this syndrome and because the basic lesion on microscopic study of the skin was found to be a vasculitis, ACTH has been used in therapy by a number of workers.

It would seem that ACTH offers symptomatic relief for these patients and this alone can prevent some of the crippling or even fatal complications. It ap-

parently will not prevent the development of chronic nephritis.

We are now treating a case of Henoch-Schonlein's purpura in a physician who developed the syndrome after a severe sore throat. He found he could control his symptoms and even could stop it at any stage of its development by taking penicillin. He took 300,000 to 600,000 per week for 1½ years before coming to us. We put him on an exclusion diet and gave him subcutaneous injections of the bacteria to which he showed allergic skin tests. His symptoms have been controlled completely now for 3½ months in spite of his returning to a general diet. Previously he could not go longer than 7 to 14 days without penicillin. This case will be reported in detail after further observation.

Dr. John S. Atwater, Atlanta, Ga.—Dr. Freeman mentioned the Rowe elimination diet. I also have not had too satisfactory an experience with this dietary approach. Some clinicians in other parts of the country apparently have had better experience than we. I should like to call your attention to the fact that there is another way of approaching the food allergy problem. Dr. Arp is familiar with it. Dr. Hal Davison taught it to both Dr. Arp and to me some years ago. We take the patient off of all food and give him nothing but chemically pure or U.S.P. dextrose and vitamins. The latter are usually given in the injectible and water soluble form. The dextrose water varies in concentration with the individual, but usually one teaspoonful diluted to taste six to eight times daily, is satisfactory. This is continued for a minimum of four days. In addition the patient may be given a tablet to supply some of the mineral needs. At the end of the four-day period we add one or two foods to the diet and have the patient eat liberally of that food every day for four successive days. For example if milk were the food to be added, it would be partaken in abundant quantities, as much milk as the patient could hold, for four days, with no other food. If at the end of that time the patient has not experienced any aggravation of his symptoms then one might well assume that that food is of no particular importance at the particular time, and on the fifth day would add another new food. On the other hand if during the addition of that food the patient has an aggravation of his symptoms, then we would regard that food suspiciously and omit it completely from the diet for several months. Such an offending food would then be considered as a possible offending allergen.

We have had much better fortune weeding out some of these gastro-intestinal problems with this approach than with any of the other elimination types of diet.

Dr. Freeman (closing).—I agree with Dr. Arp that corticotropin or cortisone may justifiably be used in the face of a deteriorating condition. Our cases treated thus seem not to have been helped. Certainly further critically controlled observation is required.

Dr. Atwater's approach to an elimination diet is attractive. However, we are still faced with an exceedingly difficult problem of supplying ample protein to a depleted person in whom an adverse reaction to all protein was the rule. How I will try to settle that taxing issue next time is hard to say.

CORTISONE IN OPHTHALMOLOGY*

CLINICAL EVALUATION OF THE THERAPEUTIC RESULTS

By LOUIS A. BREFFEILH, M.D.
Shreveport, Louisiana

A preliminary report on twenty patients treated with cortisone was presented at the seventy-first meeting of the Louisiana State Medical Society in New Orleans, Louisiana, on May 9, 1951. Since that time the original twenty and an additional one hundred and eighty-nine patients have been studied. A clinical evaluation of the therapeutic results obtained through the use of cortisone has been compiled, tabulated and summarized in this presentation.

Source of Study.—The majority of the cases presented were from the patients who were treated at the office. The Air Force patients were hospitalized in compliance with the existing regulations. On the completion of the cortisone therapy, all the patients were followed for a three months period.

I should like to take this opportunity to thank the United States Air Force and the medical staff of the Barksdale Air Force Base Hospital for their cooperation in the study of the cases presented and for their permission to utilize the clinical results in this presentation.

Method of Treatment.—Cortisone was administered both locally and systemically as needed for the disease conditions. The medication was administered locally, at first, as a four-to-one dilution with saline, later in the 2.5 and the 0.5 per cent solutions of cortone,® and at night 1.5 per cent cortone® ophthalmic ointment supplemented the daily medication. Local medication was initially instituted hourly, and the dosage decreased on an hourly basis as indicated. The systemic medication was administered intramuscularly. The initial dosage was 300 milligrams the first twenty-four hours, 200 milligrams the second day and a maintenance dosage of 100 milligrams daily thereafter. In none of the cases presented was the systemic medication given for more than seven days.

---

*Read in Section on Ophthalmology and Otolaryngology, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

Concurrent Therapy.—In all cases antibiotic medication was administered both locally and systemically as indicated. Other medications necessary for the treatment of the underlying pathological condition were also administered. In none of the patients presented was fever therapy administered in any of its various forms.

Evaluation of the Therapeutic Results.—At the suggestion of the chairman the results were tabulated and evaluated on a clinical basis. It was felt that such a practical approach would better evaluate the medication as an adjunct to the medical armamentarium for practicing clinicians.

OCULAR DISEASES TREATED WITH CORTISONE

Diagnosis	Number of Cases	Results Good	Fair	Poor
Allergic conjunctivitis	17	9	5	3
Follicular conjunctivitis	2	..	2	..
Phlyctenular conjunctivitis	2	2	..	..
Conjunctival hemorrhages	3	..	3	..
Episcleritis	3	2	1	..
Corneal foreign bodies with complications	16	16	..	..
Corneal lacerations with complications	14	10	2	2
Interstitial keratitis	8	5	2	1
Corneal dystrophies	5	..	2	3
Herpetic keratitis	2	2	..	..
Corneal ulcerations	11	8	..	3
Iridocyclitis				
(a) non-granulomatous	16	16	..	..
(b) granulomatous	4	..	4	..
(c) with associated arthritis	2	1	..	1
(d) traumatic	3	3	..	..
Choroiditis				
(a) acute choroiditis	4	3	1	..
(b) subacute choroiditis	15	3	6	6
(c) old choroidal scars	3	..	..	3
Diabetic retinopathy	3	..	..	3
Retinal hemorrhages	4	..	..	4
Massive vitreous hemorrhage	1	..	..	1
Macular degenerations	6	..	2	4
Endophthalmitis	3	..	..	3
Dislocated lens (posterior)	1	1	..	..
Subluxated lens	1	..	..	1
Optic neuritis (bilateral)	1	1	..	..
Retrolental fibroplasia	4	..	1	3

TABLE 1

POSTOPERATIVE INFLAMMATION TREATED LOCALLY WITH CORTISONE

Diagnosis	Number of Cases	Results Good	Fair	Poor
Pterygia	27	23	4	..
Glaucoma	3	3	..	..
Intra-ocular foreign bodies	4	4	..	..
Cataracts	17	13	2	2

TABLE 2

The results were evaluated on both the subjective and objective improvement obtained by the patient. The cases reported as good were those in which both subjective and objective improvements were obtained. Fair results were reported for those patients who obtained either a subjective or objective improvement, and poor for those cases in which no improvement was found.

The cases of allergic conjunctivitis consisted of nine patients with known allergic agents and eight with unknown causes. It was in the latter group that three cases obtained poor results. The two patients with follicular conjunctivitis presented no objective improvement, but both reported subjective improvement. The two cases of phlyctenular conjunctivitis made very rapid improvement after having responded poorly to other therapy. In the three cases of conjunctival hemorrhage the absorption rate was just slightly increased over other forms of treatment. A patient had a recurrence while on cortisone medication. Two cases of episcleritis responded well to the treatment. A patient reported subjective improvement, but the reaction, although improved, still persisted after treatment.

The sixteen cases of corneal foreign bodies with complications all resulted in rapid healing. These cases were subdivided: three were centrally located in the pupil; five had associated ulcerations; seven, iritis; one, multiple corneal abscesses. The following cases were referrals who had previous treatment of four to fourteen days, three with central scars; four with associated iritis; one with multiple abscesses. In all cases the results were good. The fourteen cases of corneal lacerations with complications were subdivided: one large corneal laceration, one with scar and pannus formation, nine with iritis, one with anterior chamber hemorrhage, one with macular hemorrhage and one with secondary glaucoma. The following cases were referrals after previous treatment of three to thirty days: one scar with pannus formation, four with iritis, one with large corneal laceration, one with macular hemorrhage and one with secondary glaucoma. In only the latter two cases was a poor result obtained. Two of the iritis cases obtained objective and subjective improvement, but no visual improvement was ob-

tained in one case due to occlusio pupillae and a cataract, and in the other case due to a macular hemorrhage with traumatic cataract. These cases were reported as fair results.

The eight cases of interstitial keratitis consisted of two with known syphilis, three with unknown etiology, three with old corneal scars of many years duration. The last three cases were referred for corneal transplantation. The two known syphilitic cases had received the rapid penicillin therapy, and one had received three months of mapharsen® therapy with no response. After only one week of cortisone therapy, the lesion cleared; and after one month, the corneas cleared. The cases of unknown etiology also responded well to the medication. In the three cases of old corneal scars, the scars decreased in size and visual improvement was obtained. In one case the scars were so intense that improvement was only slight. Under the slit lamp examination on cortisone therapy there was a noticeable decrease in vascular activity.

In all five cases of corneal dystrophy there was no objective improvement. Two patients obtained symptomatic relief. Whenever the eyes became irritated the medication was used for a two weeks period.

The two cases of herpetic keratitis consisted of a case of dendritic ulcer and a case of herpes zoster ophthalmicus. Since the virus is intracellular, it has been my policy to debride a large area of the corneal epithelium in dendritic ulcers. The case of herpes zoster ophthalmicus was referred after seven days of previous treatment. Both cases responded to cortisone with very minimal scars. Recent research indicates that cortisone should not be used on dendritic ulcers, as in many instances the ulceration has been exaggerated.

The eleven cases of corneal ulcerations consisted of eight cases with acute corneal ulcers and three with old corneal scars. The acute cases responded to cortisone in conjunction with other supportive medication. Although vascular activity of the cornea decreased, the old scar tissue failed to respond.

Of the sixteen cases of iridocyclitis, three were recurrent cases and two were associated with secondary glaucoma. All responded favorably to the medication. The recurrent cases responded as well in each subsequent attack. The cases with secondary glaucoma had normal intra-ocular tension after twenty-four hours of treatment. The four cases of granulomatous iritis obtained symptomatic relief, as well as a decrease in the inflammatory reaction, but the corneal deposits persisted. A case with associated rheumatoid arthritis responded well at first, but later the medication lost its effectiveness. The three cases of traumatic iritis due to ocular blows responded to cortisone therapy.

The four cases of acute choroiditis consisted of two primary and two recurrent cases. In both recurrent cases there was a third recurrence after one year. All responded to the local and systemic administration of the medication. One patient was uncooperative, and only a fair result was obtained. The fifteen cases of subacute uveitis were those characterized by vitreous opacities and posterior lenticular changes. Three cases obtained good results, six obtained subjective improvement and six obtained no improvement. The three cases of old choroidal scars in the macular areas were not improved.

The three cases of diabetic retinopathy consisted of a patient with early retinitis and two with retinitis proliferans. In all three no response to the medication was obtained.

The five cases of ocular hemorrhage consisted of four with small retinal hemorrhages and one with massive vitreous hemorrhage. The retinal hemorrhages were in patients with arterial hypertension. The vitreous hemorrhage was secondary and due to severe trauma. All results were poor.

The six cases of macular degenerations were all old lesions. Although two patients reported an improvement in vision, no objective improvement was noted.

The three cases of endophthalmitis consisted of a post cataract infection and two lacerations of the cornea. In all cases the results were poor.

The two cases of dislocated lenses had an associated iritis with secondary glaucoma. One lens dislocated posteriorly and the patient failed to respond to miotic medication. When first seen, the anterior chamber was cloudy and the cornea edematous. After one week of cortisone therapy, the tension was normal; and at the end of the second week, the anterior chamber was clear. The patient with the subluxated lens refused operation although the tension remained high. Cortisone relieved the pain when used locally.

The one case of bilateral optic neuritis was referred after two weeks of previous treatment. The patient responded well to the local and systemic administration of cortisone.

The four cases of retrolental fibroplasia were all bilateral. Six of the eyes had complete membranes and two had incomplete membranes. Two eyes developed secondary glaucoma. The tension was controlled by surgery. One case, seen ten days after the condition was first diagnosed, responded to the use of atropine and cortisone in the left eye.

In the cases of ocular surgery, the local cortisone was begun on the second to fourth day following pterygium surgery. The medication was started on the third to the seventh day following cataract and other ocular surgery. Of the twenty-seven cases of pterygium surgery there were four recurrences. In all cases the results were better, as there was less scar tissue as compared to the cases in which the medication was not used.

The three cases of glaucoma surgery consisted of the two infants with retrolental fibroplasia and one adult with acute glaucoma. In all cases the medication was begun on the third postoperative day and the filtering blebs were all satisfactory.

The four cases of intra-ocular foreign bodies were all magnetic. Two had lenticular penetrations. One was removed through the posterior and three, through the anterior approach. In all cases local cortisone decreased the ocular reaction. In two cases cortisone controlled the intra-ocular tension during the absorption of the lens material. Two resulted in aphakic eyes and two had 20/20 vision.

In the seventeen cases of cataract surgery, eight were intracapsular and nine, extracapsular extractions. Four of the extracapsular extractions were referrals three to eight weeks following surgery. Two responded well to the medication, and two had a fair result due to keratitis. The cases of postoperative glaucoma and massive vitreous hemorrhages were also referrals and the results were poor.

CONCLUSIONS

(1) Two hundred and nine patients were treated with cortisone. The results were good in one hundred twenty-five cases, fair in thirty-seven and poor in forty-seven cases.

(2) The best response to local cortisone was found in diseases of the conjunctiva, cornea and iris.

(3) Combined local and systemic use of cortisone should be administered to obtain maximum benefits in inflammation of the posterior portion of the eye.

(4) Local cortisone may be used as an adjunct to ocular surgery.

(5) The prolonged local use of the medication does not produce any harmful effects.

PRE- AND POSTOPERATIVE CARE IN AIR FORCE HOSPITALS*

By FRED C. DYE, M.D.†
Geneva, New York

In 1949 the Medical Department of the United States Air Force formulated policies which are designed to meet the specific needs of the Air Force. The involvement of personnel in aircraft accidents and the types of injuries sustained, made it necessary for the Air Force to establish well equipped and competently staffed wards for the purpose of caring for the victims of such accidents.

The wards were to be known as "crash wards" and in July 1952 an Air Force Regulation was published for the sole purpose of advising all medical facilities of the importance of establishing a specific, fully developed and frequently practiced plan to meet such medical emergencies. At the same time, it was pointed out that the establishment of such facilities for the purpose of dealing with

*Read in Section on Anesthesiology, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

†Colonel, U. S. Air Force, Medical Corps, Sampson Air Force Base, Geneva, New York; Director, Department of Anesthesiology, U.S.A.F. Hospital, Sampson Air Force Base, New York.

emergencies only, could not be supported due to the waste of manpower and the duplication of equipment which would result.

The regulation did not prescribe, but only recommended, the type of ward to be utilized as a crash ward and its location in relation to surgery. By virtue of the recommended location and equipment for such a ward, it has become more than adequate for a pre- and postoperative recovery ward.

We, at Sampson Air Force Base, have established just such a ward which has been a pilot model for the Air Force. Our ward is made up of two private air-conditioned rooms and 35 ward beds, half of which are situated in glass-partitioned cubicles. The remainder of the beds are in an open ward, which functions as the crash section. The ward also contains two "prep rooms" which are used to prepare patients for surgery.

The ward is situated in close proximity to the operating rooms and is accessible to ambulances by means of a rear entrance. The physical layout of the ward, as described above, makes each patient, except for those in the private rooms, visible to the nurse on duty at all times. A central oxygen room is situated near the nurse's station and is equipped with two banks of oxygen tanks. The central system is equipped with a warning bell which signals when a bank becomes empty and permits a prompt switch-over to a full bank. From the central oxygen tank room, oxygen is piped to each bed in the ward and private rooms. Thus, each patient has the benefit of readily accessible oxygen supply of which is constantly maintained while the flow is regulated by flowmeters. Other oxygen equipment includes nasal catheters, tents, BLB masks, OEM and positive pressure masks.

Each bed has, in addition, a suction outlet complete with regulator and bottle which is attached to the wall and is supplied by a central system which is capable of handling the number of outlets utilized. The beds on the ward are of the Gatch type and are supplied with a set of shock blocks which are available when the need arises. In addition, the ward also is equipped with a pneumatic balance resuscitator, a Monaghan resuscitator, a completely equipped endotracheal tray for emergency needs and a complete tracheotomy set.

Preoperatively, the routine established at our hospital is to transfer all patients scheduled for operation the following day to the ward by 3 p.m. In this way, the ward reaches its best use as a preoperative ward, for the patient is restricted to the ward from this time on and is thus available to the ward nurse and the anesthesiologist at all times. The anesthesiologist makes his visit to each patient and checks the chart and laboratory findings for any questionable results or unusual physical abnormalities which would influence the anesthesia choice or method of administration. Following an interview with the patient and the explanation of the anesthetic procedure to be used the following day, the preoperative orders are written and given to the nurse.

The utilization of the ward as a preoperative center has shown its worth many times over. Under these circumstances, the preoperative care and medication are adequately controlled at all times. Careful check of the patient's temperature has brought to our attention many patients who have not been deemed to be in the proper state of health for operation and consequently have been cancelled on the eve of their proposed operation. By using such precautions, it is felt that our incidence of postoperative respiratory complications and other related complications have been greatly reduced.

Upon completion of the operation, the patient is returned to the ward by trained personnel. Here his postoperative care period begins and he is taken over by specially trained graduate nurses and corpsmen who have been selected and trained by the anesthesiology department for work on this ward. The personnel have been thoroughly indoctrinated in the use of all equipment on the ward, by classes, which we conduct personally.

The postoperative period is under the care of corpsmen, who are supervised by graduate nurses, until the patient has responded and regained all his reflexes. Frequent observation of pulse, blood pressure and respiration are made and recorded graphically, which helps to insure against the unrecognized de-

velopment of postoperative shock. An adequate airway is established and maintained at all times. During this recovery phase, oxygen and suction are utilized to the utmost and the patient's fluid balance is carefully maintained by the use of blood, plasma, blood substitutes and vasopressor drugs ordered by the anesthesiologist or the surgeon.

In general, each patient who has received a general anesthetic is returned to the ward with an intravenous infusion in place and the nurse can carry out the postoperative fluid orders immediately from the wide variety of intravenous fluids which are stocked on the ward and from the blood bank which is close by. Special forms of intravenous solutions such as alcohol, protein hydrolysates are available on the ward, as are some of the plasma substitutes such as gelatin and dextran. In addition, intra-arterial, intra-osseous and venous cut down sets are always available. Recently we have used intramuscular dramamine® in the management of postoperative nausea and vomiting with very satisfactory results.

The lateral position for patients who have received general anesthesia is utilized during the recovery phase. In addition, the patient is turned by the attendant corpsman at regular intervals, to reduce the respiratory complications that can develop during this period. At the same time, all pressure areas are kept well padded and carefully watched to prevent nervous or circulatory complications.

Postoperative pain control is maintained by the careful use of opiates, to prevent hypoxia, and by the use of barbiturates in combination with the opiates where the dose of the latter may be greatly reduced by this combination. In addition, the anesthesiologist may be called upon to use his skill in regional anesthesia to perform indicated nerve blocks. This interruption of the pain pathways is sometimes effective in providing relief long after the effect of the anesthetic agent has worn off. Some of the blocks more commonly used are the intercostal, the paravertebral and lumbar sympathetic block. Stellate ganglion blocks are also used to relieve spasm of the arteries of the upper limb.

The usual surgical care can readily be given in the recovery ward under the supervision of the surgeon. The care of the wounds and dressings is maintained by means of the sterile supplies which are available on the dressing cart at all times. We are equipped to manage the special forms of drainage which are required in patients who have undergone chest surgery or genitourinary tract surgery. All patients who have been subjected to a major operation are maintained as over-night patients on the ward because of the easy accessibility to special nursing care and resuscitative equipment. Thus, the surgeon is assured that the patient will have the benefit of our trained personnel during the recovery phase and at the time when it might be necessary to use special recovery technics and apparatus.

The close proximity of our recovery ward to the accident room of the hospital provides an excellent means of caring for the vital needs of the seriously injured patient. In effect, the admitting physician sends all this type of patient to the recovery ward until it is established that the period of shock and other factors is ended. By this use of the centralized equipment and trained personnel on the recovery ward, we have found that our incidence of morbidity and mortality has been greatly reduced.

In conclusion, it is hoped that the above discussion has furnished a picture of the type of care that the United States Air Force Medical Department is affording its officers and airmen.

ACUTE GANGRENOUS HERNIAL APPENDICITIS WITH PERFORATION*

CASE REPORT

By JOHN S. JACKSON, M.D.
LANSING G. CHILDS, M.D.
and
H. MAX SCHIEBEL, M.D.
Durham, North Carolina

A review of the literature reveals that herniation of the vermiform appendix occurs in less than one per cent of all hernias. An acutely inflamed appendix lying in any hernial sac is found very infrequently.

*From the Surgical Service, Lincoln Hospital, Durham, N. C.
*Received for publication January 16, 1953.

Wakeley[1] found the vermiform appendix in only twelve of 1232 cases of inguinal hernia. Of this number only one contained an acutely inflamed appendix in the hernial sac. The appendix appears most commonly in the inguinal type of hernia.

The following case report revealed an acute gangrenous appendix with rupture into an indirect inguinal hernial sac.

J. C., age 29, a colored man, was admitted to the hospital on December 14, 1949 at 2:45 A. M. He said that he had been ruptured for several years. During the preceding three days he had been unable to reduce the hernia. Twelve hours prior to admission he began to experience severe pain in the region of the mass. This was followed by nausea and several episodes of vomiting.

Examination showed a well developed and well nourished man with a temperature of 100° F., pulse 92, respirations 20, and a blood pressure 118 systolic and 68 diastolic. In the right inguinal region there was a firm mass measuring 3 x 5 cm. The skin and subcutaneous tissues overlying the mass were markedly indurated and tender. There was voluntary spasm of the lower abdominal muscles. The laboratory data were as follows: white blood cells, 14,000; red blood cells, 4,500,000; hemoglobin, 14.5 grams. Urinalysis was negative.

A preoperative diagnosis of incarcerated right indirect inguinal hernia with possible strangulation was made.

At operation location of the hernial sac was difficult due to the intense inflammatory reaction. Upon opening the sac a small amount of foul smelling pus escaped. Further dissection revealed an acute gangrenous appendix with rupture into the hernial sac. An appendectomy was performed. The appendiceal stump was inverted. A modified Bassini type of herniorrhaphy was done utilizing interrupted cotton sutures throughout all layers. Except for a slight rise in temperature on the first postoperative day the patient had an uneventful recovery.

Pathological diagnosis.—Serous membrane with an acute inflammatory process and acute gangrenous appendicitis.

SUMMARY

(1) Herniation of the vermiform appendix occurs in less than one per cent of all hernias.

(2) Acute appendicitis within an inguinal hernial sac is a rare occurrence.

(3) A case report of an acute gangrenous appendicitis with perforation into an indirect inguinal hernial sac has been presented.

REFERENCE

1. Wakeley, C. P. G.: Hernia of the Vermiform Appendix. Lancet, 2:1282, 1938.

ELECTRO-ENCEPHALOGRAPHY IN ALLERGIC EPILEPSY*

By SUSAN C. DEES, M.D.
Durham, North Carolina

Electro-encephalography is a valuable diagnostic test in the study of convulsive disorders. A number of characteristic brain wave patterns have been observed, and correlated with specific organic and functional changes in cerebral activity and clinical conditions. For example, 3 per second spike and wave are seen in *petit mal,* and high voltage fast waves are present in *grand mal* seizures.

In a previously reported study of the electro-encephalograms of a group of allergic children, cerebral dysrhythmia, an unexpected finding, was encountered in 45 per cent of the patients studied.[1] In 41 per cent this dysrhythmia was confined to the occipital area. These children had no convulsive disorders, nor history of ever having had convulsions.

Further observations on 22 allergic children who also had convulsions or a history of convulsions, revealed occipital dysrhythmia in 13, or 59 per cent.[1] Combined with this abnormality, slow spike and waves were present in 5, while one child had frontal dysrhythmia. The electro-encephalographic records of allergic children, both without and with convulsions, showed a high incidence of the same type of abnormality, occipital dysrhythmia. In these 22 children it seemed necessary to diagnose as convulsive disorders all patients who had even a suggestive history, in order not falsely to attribute abnormal electro-encephalograms to allergy which might conceivably be due to any other cause. This may, in part, account for a lower percentage of occipital dysrhythmia in this series than in

*Read in Section on Allergy, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

*From the Department of Pediatrics, Duke University School of Medicine and Duke University Hospital, Durham, North Carolina.

*A six-channel Grass electro-encephalograph was used. 6 monopolar or 6 dipolar tracings being recorded simultaneously for about 20 minutes. Some sleep records were used in this study.

*The author gratefully acknowledges the assistance of Dr. Hans Lowenbach, both in interpreting electro-encephalograms and in making available for study the patients from the Children's Convulsive Clinic.

a subsequent study,[2] in which a series of 37 children with active clinical convulsions, in whom allergy was suspected, were studied both electro-encephalographically and for allergy. In this selected group, occipital dysrhythmia was present in 26 children, or 73 per cent. Other abnormalities comprised frontal dysrhythmia 7, spike and wave 7, focal change 1. As an indication of the severity of symptoms the 37 children had either *petit mal* or *grand mal* seizures and 35 were receiving anti-convulsant drug therapy. Incidentally, when treatment for allergy was added to their regimen, anti-convulsants were required for only 23 children.

A third group of 23 patients, with convulsions, presumably without any clinical allergy will now be reported. These children were in regular attendance at the Duke University Hospital Convulsive Clinic for Children. Their ages were similar to the other groups, 2-14 years. All had been followed from one to five years or longer. All had either *grand* or *petit mal* type convulsions. They were selected for scratch testing solely on the basis of their availability at a time when tests could conveniently be performed, and without previous knowledge of clinical history.

The electro-encephalographic findings were predominantly those of severe generalized cerebral dysrhythmia in 18 patients or 78 per cent of the group. In two tracings the dysrhythmia was primarily occipital, in three others it was frontal in location. Slow spike and wave pattern was present in 9 records. Focal changes were seen in 2 records, both patients having abnormal air encephalograms. Three electro-encephalograms were interpreted as being within normal limits. The high incidence of abnormal tracings with generalized dysrhythmia is not surprising in a group of children with significant convulsive disorders, all of whom required regular anti-convulsant medication and in many cases with symptoms not yet entirely controlled. The findings of only two patients, or approximately 10 per cent with primarily occipital dysrhythmia is in sharp contrast to the findings in the previous study in which this was the outstanding change. One child with generalized and predominantly occipital dysrhythmia had a positive test to tobacco only. He had a history of gastrointestinal upsets after eating chocolate, and that convulsions followed vomiting. We do not consider this evidence of established allergy. In the other child with occipital dysrhythmia, this too was combined with generalized dysrhythmia, which was less marked in the frontal areas. Air studies, x-rays and lumbar punctures were negative. An unexplained eosinophilia of 5-11 per cent was found on several occasions. Skin tests were equivocal to inhalants and chocolate. There was no personal history of allergy.

The following allergens were used for this screening: dust, tobacco, feathers, cat hair, dog hair, wheat, eggs, milk and chocolate. Fourteen of the 23 children had entirely negative skin tests; of the remaining 9, no child had a reaction greater than one plus to any allergen. Of these, one child reacted to tobacco only, 6 had one plus reaction to tobacco and questionable reaction to one or more inhalants or foods. Five had the combination of one plus or questionable reaction to dust, tobacco and wheat. Three of these five reacted questionably to eggs, milk or chocolate in addition. One other child whose skin was reactive to the glycerine control, also had a one plus reaction to cat and dog hair.

We recorded even minor skin reactions and minor, questionable, or potential allergic symptoms. In approximately half of the children giving positive skin tests, both personal and family history were negative for allergy. Several children with negative tests had a history of one or more of the following conditions: colic, frequent colds or bronchitis or food intolerance. One child had an allergic rhinitis with positive skin test; one had a history of infrequent urticaria and negative skin tests; one had a rash after dilantin® with negative skin test; one child had a two-year history of convulsions occurring only from August through October with a positive skin test to rag weed and questionable reactions to inhalants and foods. None of these children had occipital dysrhythmia. We consider, therefore, that there are 3 children in this group with mild clinical allergy, one with

seasonal convulsions, possibly of allergic origin. Another child in this group with *grand mal* and *petit mal* epilepsy, previously had been referred to the allergy clinic for study because of eosinophilia ranging from 13-35 per cent. She was found to have pin worms. A brief period of improvement was noted while white potato was eliminated from the diet. Skin test was positive for white potato. The symptoms recurred within one month on an elimination diet and continued in spite of anti-convulsant medication. The electro-encephalogram in this child showed spike and wave changes with generalized cerebral dysrhythmia. We do not consider this child to be a primarily allergic individual. In a series as small as the present one, we do not consider the absence of complete correlation between patients with suggestive clinical allergy and occipital dysrhythmia as strange, since we did not find occipital dysrhythmia in all of the frankly allergic children we have studied.

In the light of this study, in which the incidence of both allergy and occipital dysrhythmia is low, we believe we have presented further evidence that the presence of occipital dysrhythmia in electro-encephalography may indicate the presence of allergic sensitization. If it is considered in this way, as eosinophilia is considered a possible but not an absolute index of the presence of a sensitivity reaction, we may be able to detect potentially allergic children among those with unexplained idiopathic convulsive disorders.

SUMMARY AND CONCLUSIONS

(1) Occipital dysrhythmia had previously been reported as the predominant electro-encephalographic abnormality in both children with allergy alone, or allergy combined with convulsive disorders. This abnormality was found in 41 per cent of one series and in 73 per cent of allergic children with convulsions.

(2) In contrast, a group of 23 children with convulsive disorders of *grand* and *petit mal* type, without major clinical allergy, showed occipital dysrhythmia in less than 10 per cent. Generalized cerebral dysrhythmia was present in 18 or 78 per cent of the records, spike and wave in 9 tracings.

(3) We conclude that occipital dysrhythmia occurs with sufficient frequency in children with allergy complicated by convulsions, and in so few non-allergic children with convulsions that its presence in the electro-encephalogram of a child being investigated for a convulsive disorder, should draw attention to the possibility of an associated allergic condition.

BIBLIOGRAPHY

1. Dees, S. C. and Lowenbach, H.: The Electro-Encephalograms of Allergic Children; Ann. Allergy, 6:99-108 (March-April) 1948.
2. Dees, S. C.; and Lowenbach, H.: Allergic Epilepsy; Ann. of Allergy, 9:446-458 (July-August) 1951.

WHAT THE GENERAL PRACTITIONER SHOULD KNOW ABOUT THE MANAGEMENT OF ALLERGIC SKIN DISORDERS*

By WILEY M. SAMS, M.D.
Miami, Florida

The general practitioner, as well as all practitioners of the healing arts, should be equipped with a clear-cut, concise definition of allergy, and the ability to explain it to his patient in every day, common terms, and then tell him how it applies to the condition which he may present for investigation. While this every day definition may not satisfy all of the technical possibilities which can be posed by the investigator, or specialist, in this field, it must be scientifically correct and easily understood. The physician should constantly remind himself that he is dealing not with a specific disease, but with a concept concerning the pathogenesis of disease, which has a wide range of application. Much of the misunderstanding concerning allergic disorders has its origin in the uncorrected assertions which are made by those who are only partly informed, usually by patients who have some allergic information, but who have not been properly instructed in the character and nature of the disturbance which afflicts them.

The training of the practitioner who first sees the greatest majority of all of our patients is in no way different initially from that to

*Read in Section on Allergy, Southern Medical Association, Forty-Sixth Annual Meeting, Miami, Florida, November 10-13, 1952.

which all physicians are submitted in their undergraduate years. Every physician, and every patient, should be taught that the allergic state is an altered state of reactivity, and that any living organism which comes into contact with a foreign substance, either by external or internal exposure, may develop one or more alterations. The type and character of the reactions which ensue, and the disorders which they produce in the living organism, are extremely varied and of fundamental significance in many fields of medical endeavor.

The subject of allergic disorders should not be left as an elective course in the medical program, to be presented as an after-thought by an obscure instructor in the final year of medical study, but should be introduced early in the medical curriculum. The student of bacteriology and immunology should certainly be introduced to the theory and mechanism of bacterial allergy and its relation to infectious disease. The subject should be re-opened and further expanded in a discussion of physiologic and pathologic phenomena. Though the medical schedule is full, and the time allotted for various subjects is always considered inadequate, I find it difficult to explain the nature and development of many of the classical infectious diseases without referring to the altered state of reactivity which the organism manifests against the invading agent which produces the disease. The allergic manifestations of infectious disease are nowhere better illustrated than in the study of syphilis, but they are equally obvious in tuberculosis, trichophytosis and many other common diseases of widely diverse origin. Allergic disturbances are not rare, unusual, unique and, therefore, relatively unimportant. The mechanism and theory of allergic reaction has a wider range of application to a larger number of diseases than almost any other concept which we can use to explain the development of pathological processes within the body. The principles of allergy then have an application so wide that they should be taught as a part of a number of preclinical as well as clinical subjects in our medical schools. It is all too frequently a neglected subject.[1]

In spite of the broad application of the principles of allergic disturbance to the pathogenesis of disease, and of the wide variety of cutaneous disorders, there are only two which are indisputably allergic in origin.[2] The first of these is the eczematous type of contact dermatitis, which has already been discussed on the program. It is the commonest of all of the cutaneous disturbances, and is excited by a large number of substances to which the skin is exposed as a matter of routine, under widely varying circumstances, by every individual. The specificity of the allergens and their etiological significance is usually directly supported by the history, is open to experimental proof by contact patch-testing, and, where withdrawal of the allergen leads to prompt improvement and a return to normal, its re-exhibition is followed by an exacerbation of the disorder. These events take place in a reasonably short time, a matter of days, so that the relationship between cause and effect is clearly evident, and is seldom a matter for dispute.

The second allergic dermatosis in which the proof appears adequate is acute urticaria. Once again, the characteristic pattern is reproduced by the specific allergen, whether it be ingested, injected, inhaled, or absorbed through the cutaneous surface. It develops suddenly, it may become generalized, and it may last for a matter of a few hours, a few days, or several weeks. The exciting allergen is frequently recognized by the patient. It is most likely to be identified by the passive transfer technic, which will demonstrate the specific circulating antibodies, but these tests cannot be elicited as readily and as frequently as is the case with epidermal contact type dermatitis. In any event, if the actual allergen is eliminated, the urticaria will disappear, and will not reappear unless the subject is again exposed.

Urticarial eruptions due to physical agents, including trauma, heat, cold and solar exposure, have been experimentally studied and proven to be the result of sensitization to specific metabolities which may be demonstrated by passive transfer tests. In this group we have cholinergic urticaria, in which attacks are definitely precipitated by exposure

to heat or to emotional tension. The patient's skin appears to be hypersensitive to acetycholine, which is liberated at the cutaneous nerve endings. In addition to the acute urticarias, and urticaria due to physical agents, we have a much larger and much more common group of urticarial disorders which are chronic, and in which no allergic factor has been, or can be, demonstrated by the methods which are today available. It would appear that the histamine liberation is due to some mechanism other than an antigen antibody reaction, or that it is due to some allergic mechanism which has not as yet been elucidated.

Eruptions due to allergic reactions to drugs are so frequently urticarial that they may be considered a part of this group. The picture produced may be erythematous, urticarial, or associated with marked edema (angioneurotic edema), or they may persist for a longer period as an infiltrated lesion (erythema nodosum), a bullous eruption, or a fixed eruption, and many of these have an allergic mechanism as a basis for the picture they produce. The subject of drug eruptions is a rapidly changing field. Many of the older medications are now less used, but have been replaced by an even greater number of sulfonamids and the newer antibiotic drugs, each of which has presented new problems in the diagnostic field of cutaneous disorders. I need mention only erythema nodosum, which has been produced by the sulfonamids, and the recurring vesicular eruptions on the hands and feet which are common after administration of penicillin, to indicate two new pictures in the field of allergic reaction to drugs.

The discussion of atopic dermatitis too often resembles a political discourse. If one chooses only that which fits his particular theory or thesis, he may adduce a large number of facts to support his contention regarding the etiology of this troublesome and unpredictable disorder. None of us has more than a theory to explain why this chronic dermatitis will appear, or disappear even without treatment, at certain times. None can explain why the individual with an atopic background will present alternating episodes of asthma and atopic dermatitis, or some other manifestation which is related. None of us has been able to explain the apparent lack of etiological relationship between the urticario-genic allergens to which these patients react, and the dermatitis which is manifest on the skin. We can, I believe, agree on certain principles in the management of these disorders which are so troublesome, and it is toward that end that I will devote the remainder of my discussion.

Although allergy is one of the fundamental concepts in the reaction of tissue to disease, not every patient with skin disease can, or will, be seen by either an allergist or a dermatologist. The general practitioner will see and adequately care for a large majority of these patients, many of whom will exhibit an acute, transient problem, and require no more than symptomatic treatment. It is here that the problem of diagnosis will present itself, and the ability to separate the acute from the chronic, the contact dermatitis from atopic dermatitis, and allergic disorders from those which are nonallergic, will be of primary importance. In no condition other than skin disease is failure to improve more evident, both to the patient and to his associates. To promise that which cannot be achieved is, in the eyes of the patient, as much a failure as to overlook the cause of the condition which, when once established, seems to be obvious.

Let us assume that the evidence which can be collected from the history, as well as the appearance of the eruption, is sufficient to place it in the allergic group. The first, and almost self-evident, principle is to remove all known or suspected allergens which might have etiologic significance. This requires, of course, judgment and experience, but it certainly should include all of the medications which the patient has taken within the preceding thirty days, and all of the applications which have been used in the treatment of the disorder. This principle has both scientific and psychological support, and should be followed even though the previous methods of treatment are considered satisfactory and not harmful. The interdiction of previously used preparations should, of course, follow an adequate history covering past events, the patient's allergic background, the medications which he has taken and used, and such treatment as he may have received by injection.

The second principle will be to outline a

plan of treatment which will afford the greatest measure of symptomatic relief, control local infection if present, reduce inflammatory reaction, and avoid the introduction of new potential sensitizing materials. Toward this end, the treatment should be simplified, insofar as it is possible, and only bland, local medications should be used. The type of local treatment will depend upon the character of the dermatitis. The principles and application of dermatologic therapy are acquired by experience. In general, they include the use of wet dressings for secondarily infected dermatitis, acute exudative lesions and those which are highly inflamed. Dilute Burow's solution, or one of its modifications, is a favorite. For generalized eruptions, baths are frequently most efficacious. For less acute dermatitis, lotions are most acceptable, while the more chronic disorders will tolerate a wide variety of ointments and pastes. In the choice and selection of the agent to be used, the degree of inflammatory reaction, and the character of the eruption, determine the application which will be most acceptable. In any event, all potential allergens should be excluded, for the individual may already be sensitive to the medication, or he may develop a new sensitivity if exposed to an agent which is a potential cutaneous irritant.

Suppression of the inflammatory reaction is an objective usually much to be desired. It can be achieved slowly with appropriate local applications; it can be influenced favorably in many cases by a small amount of radiation therapy, and it can be suppressed dramatically in some severe cases with cortone or ACTH. The latter use of a recently introduced endocrine product should be reserved for extremely severe generalized or extensive eruptions, where the reaction is transient or self-limited, and it will not be necessary to continue the drug over an extended period.

Pruritus, or itching, is a sensation peculiar to the skin, but quite characteristic. It is the cause of most of the disability and discomfort which we observe in many cutaneous conditions. It may be mild, or extremely severe; it may be transient, or persist over an extended period; it is usually paroxysmal in nature, and this is particularly true in the atopic form of dermatitis. It is the severity of this symptom which causes the patient to seek all forms of relief and most often leads him into disaster. He will accept any form of treatment proffered by his neighbor, or friend, or any prescription or proprietary medication, without knowing either its composition or purpose, and apply it to an already disturbed skin, and often perpetuate a condition which would otherwise be self-limited. For this reason, a medication to control itching must always be offered, otherwise something will be used, and it may not be wisely chosen. Many cases of contact eczematous dermatitis are produced by the application of local anesthetic ointments, antihistamine drugs, and both old and new proprietary remedies which are designed to relieve pruritus. There is not one which is always effective. There is not one which has not, in some individual, been the cause of an eczematous contact eruption.

Sedation for the relief of pruritus is helpful, but never entirely successful. The discovery and perfection of the antihistamine drugs has given us another weapon in the management of allergic disorders. It has its greatest field of usefulness in the urticarial lesions, where it is sometimes almost a specific. On the other hand, its usefulness in contact eczematous dermatitis, and in many cases of atopic dermatitis, is frequently open to question. Some of these preparations do have a sedative action, but they often fail to exert any appreciable influence on disorders which are not urticarial in character. A wide variety of preparations is available, and one is occasionally helpful where others fail. The use of the antihistamine drugs in topical applications apparently will have a diminishing field of usefulness, as an increasing number of patients are becoming sensitive to these drugs, and this will eventually preclude their use in many cases.[3]

Once the acute dermatitis has subsided, the practitioner must then decide which cases should be referred for investigation, what type of investigation these patients should have, and what consultant should be chosen. If, of course, the disorder is an acute one which terminates abruptly and does not recur, investigation is hardly indicated or worthwhile. If the condition recurs at frequent intervals, he should realize that he is being presented

with an opportunity to determine the cause, if this insight and information are adequate. It is here that his ability as a detective will be utilized to its full extent, and it may be that his patience will be tested in repeatedly reviewing the history for all of the possible factors which may cause exacerbation. If the recurrence of the dermatitis is associated with some known or suspected allergic disturbance, and especially where the patient has a history of atopy or related phenomena, these should receive adequate and concurrent investigation. If the practitioner does not have an interest in, and has not been trained to recognize the many details which may be significant, he should at this point seek help from those who have a primary interest in diseases of this character.

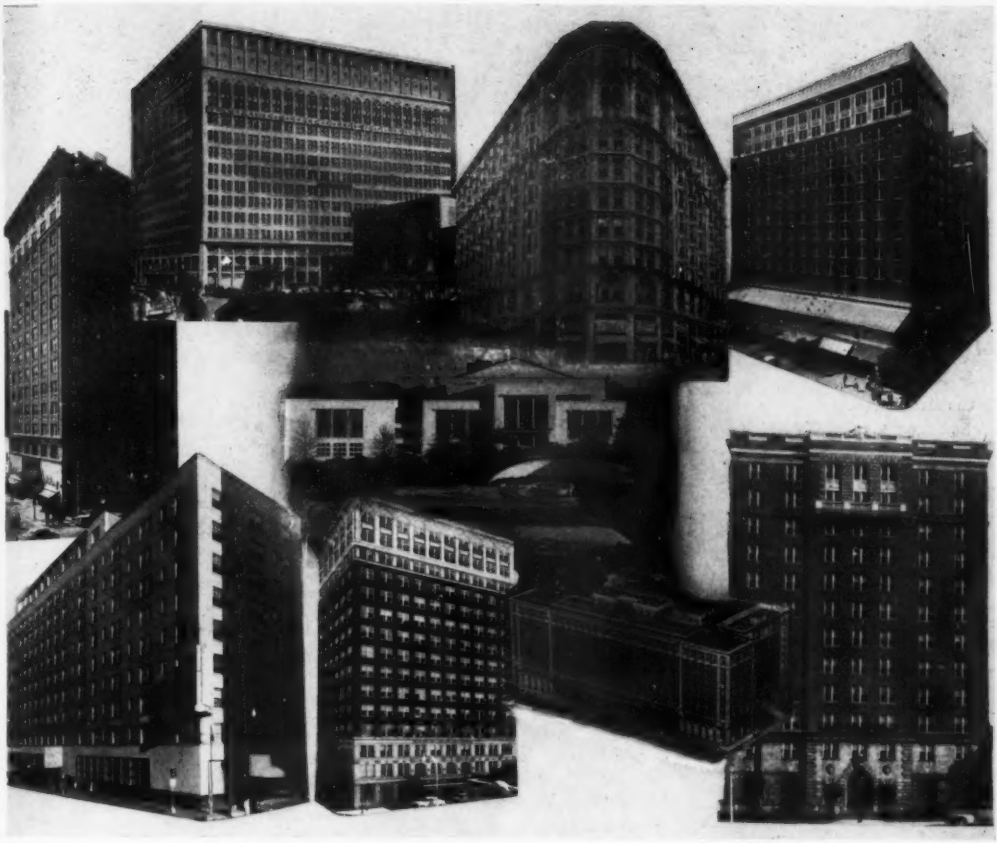
Atopic dermatitis and the patient with chronic urticaria, present a challenge to the individual physician who seeks a solution to the problem, and to medical science which has as yet evolved no method of determining the cause in the majority of cases. Rarely is the causal agent found; even more rarely can it be demonstrated. The practitioner should be familiar with what can be, and what cannot be, achieved, in order that he may properly advise and prepare his patient for some of the disappointments which must be accepted. He should be aware of the fact that approximately half of the patients with atopic dermatitis will react to a wide number of allergens, while an almost equal number will fail to react to anything, and yet clinically they appear to be indistinguishable. While positive wheal reactions which are observed on routine testing may be a portent of things to come, or be related to past disturbances of hay fever and asthma, they are not necessarily indicative of any existing allergic condition and, if indicative of clinical sensitivity, it is not an eczematous one. The search for a definite cause in answer to one of these problems should be limited to one who has mastered the technical problems involved, and who can devote all, or a large part, of his time to this work. No one has mastered all of the problems, and no one can predict with certainty which case may be benefited by investigation, nor which may fail to yield any significant findings.

There is perhaps no question which more provokes the serious student of allergy than to be asked if he has "faith" in the subject. I look upon allergy as a great unifying concept in which there are still many fields of ignorance. I have the greatest amount of faith in those concepts which are supported by scientific proof, and in which the relationship between cause and effect are clear, evident, and open to experimental proof. On the other hand, I have very little faith in our present methods of investigation, when we direct them toward resolving the problems which are posed by the patient with atopic dermatitis. Our present methods are apparently inadequate, in most cases, to shed any light on some of our problems. A more useful, and perhaps different, approach is needed to resolve the conflicts which now exist.

Successful management then includes (1) exclusion of the activating agent, if it is known; (2) treatment of the dermatitis which exists; and (3) the selection of therapeutic agents which are unlikely to precipitate future or additional trouble. It is difficult, of course, for both doctor and patient to observe these rules absolutely, where the relief is only partial and the patient's troubles are continued ones.

BIBLIOGRAPHY

1. Swineford, Oscar, Jr.: Undergraduate Education in Allergy. J. A. Amer. Med. Coll. **21**:265-270 (Sept.) 1946.
2. Rothman, S.; and Walker, S. A.: The Problem of the Emotional Factors in the Allergies. International Arch. of Allergy & Applied Immunol. **1**:306-315, 1951.
3. Ellis, F. A.; and Bundick, W. R.: Appraisal of Topical Use of Antihistamines. J. A. M. A. **150**:773-776 (Oct. 25) 1952.



Municipal Auditorium in center surrounded by a group of leading hotels.

SOUTHERN MEDICAL ASSOCIATION

Forty-Seventh Annual Meeting

Municipal Auditorium

ATLANTA, GEORGIA

October 26, 27, 28 and 29, 1953

Registration, Scientific and Technical Exhibits, and Section Meetings in Municipal Auditorium.

All Activities Under One Roof.

See other side for hotel accommodation form and other information

APPLICATION FOR HOTEL ACCOMMODATIONS

Southern Medical Association Meeting, Atlanta, October 26, 27, 28 and 29, 1953

A Housing Bureau has been established for your convenience in making hotel reservations in Atlanta for the forthcoming meeting of the Southern Medical Association. Comparable room rates are listed. *Use the reservation blank below.* Please specify your first, second, and third choice hotel. All requests for reservations should give: (1) anticipated date and hour of arrival; (2) date and approximate hour of departure; and (3) names and addresses of all persons who will occupy the accommodations. ALL RESERVATIONS SHOULD BE CLEARED THROUGH THE HOUSING BUREAU. Since all requests for rooms will be handled in chronological order, you should mail your application as early as possible. All reservations will be confirmed. **There will be no Headquarters Hotel, the Municipal Auditorium will be General Headquarters.**

Hotel	Single	For Two Persons		Suite
		Double Beds	Twin Beds	
ANSLEY	$5.00–7.50	$6.50–10.00	$8.00–13.00	....
ATLANTA BILTMORE	5.00–9.00	8.00–12.00	8.00–12.00	$15.00–41.00
ATLANTAN	3.75–5.00	5.50–7.00	7.00–7.50	16.00
BRIARCLIFF	4.00–5.00	7.50–10.00	....	....
CLERMONT	3.50–6.00	6.50–9.00	7.00–9.50	....
COX-CARLTON	4.00–6.00	6.00–8.00	6.00–8.00	....
551 PONCE DE LEON	3.00	5.00	....	....
GEORGIA	3.50–6.00	5.50–10.00	....	....
GEORGIAN TERRACE	5.00–8.00	7.00–11.00	....	....
HENRY GRADY	4.00–12.00	7.00–12.00	8.00–12.00	16.00–25.00
IMPERIAL	3.50	5.00–5.50	5.50–6.00	....
PEACHTREE MANOR	4.00–7.00	6.50–10.00	6.50–10.00	12.50–20.00
PEACHTREE ON PEACHTREE	5.00–7.00	7.50–10.50	....	....
PERSHING	4.00	6.00	....	8.00–12.00
PIEDMONT	4.00–6.50	6.00–8.00	7.00–10.00	....

HOUSING BUREAU
SOUTHERN MEDICAL ASSOCIATION
801 Rhodes-Haverty Building
Atlanta 3, Georgia

Please reserve the following accommodations for me for the Southern Medical Association meeting:

Hotel Preference	Kind of Accommodations Desired
1st Choice	Single room at $ ..... to $ .....
2nd Choice	Double room at $ ..... to $ .....
3rd Choice	Twin bedroom at $ ..... to $ .....
	Other type .....
Arrival date	hour ..... A.M. ..... P.M.
Departure date	hour ..... A.M. ..... P.M.

THE NAME OF EACH HOTEL GUEST MUST BE LISTED. Include the names of all persons for whom you are requesting reservations and who will occupy the room (s):

Name of Occupant (s)	Address
.....	.....
.....	.....
.....	.....

Individual Requesting Reservations

Name .....

Address .....

City ..... Zone ... State ...

If the hotels of your choice are unable to accept your reservation the Housing Bureau will make as good a reservation as possible elsewhere.

Southern Medical Journal

JOURNAL OF THE
SOUTHERN MEDICAL ASSOCIATION

Copyright, Southern Medical Association, 1953. Material in the Southern Medical Journal, being covered by copyright, may not be reproduced in whole or in part or abstracted without permission from the publisher and then only if due credit is given.

Published monthly by the Southern Medical Association, Empire Building, Birmingham 3, Alabama. Annual subscription, $10.00. Single copies 85c each.

Entered as second-class matter at the Post Office at Birmingham, Alabama, under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized December 20, 1921.

Volume 46 JUNE 1953 Number 6

EDITORIAL DEPARTMENT

Editor
M. Y. Dabney, M.D., Birmingham, Alabama
Associate Editors
Curtice Rosser, M.D., Dallas, Texas
Tinsley R. Harrison, M.D., Birmingham, Alabama

SOUTHERN MEDICAL ASSOCIATION
Forty-Seventh Annual Meeting
Atlanta, Georgia, October 26-29, 1953

SODIUM METABOLISM AND ECLAMPSIA

The etiology of eclampsia has for the most part defied all attempts of explanation. However, it has been recognized for a long time that sodium restriction is essential for its successful management. Exacerbations and remissions of the syndrome may at times be elicited by varying the dietary intake of sodium. It seems reasonable to assume, therefore, that abnormal sodium metabolism may be involved in the production of this syndrome. It may be that the onset of this clinical entity is associated with reabsorption by the renal tubules of abnormal amounts of sodium and water from the glomerular filtrate, resulting in hypervolemia and edema.

It is now well established that sodium metabolism of the body is regulated by the adrenal cortex through the action of an 11-desoxycorticosterone-like hormone. This is the most potent salt-retaining factor that has been identified in body fluids, and its elaboration is under the control of the anterior pituitary.[1]

Evidence of increased adrenocortical activity during pregnancy is available. In 1938 Hench reviewed clinical data that indicated striking relief from symptoms of rheumatoid arthritis during pregnancy.[2] The classical demonstration of the manner in which corticotropin and cortisone control the symptoms of the disease has suggested that this is the *modus operandi* of such remissions in pregnancy.[3] In 1950 Jailer and Knowlton observed evidence of the production of adrenocortical-hormone-like substances in an addisonian patient during pregnancy, which suggested that the human placenta, under certain conditions, might be capable of such activity.[4] In view of this work it seems likely that in pregnancy without a normally functioning adrenal cortex, the placenta may produce similarly functioning hormones. Johnson and Haines, in 1952, demonstrated unmistakable evidence for the existence of adrenocortical-hormone-like activity in human placental tissue.[5] There is also evidence of increased adrenocortical hormone activity during toxemias of pregnancy. The marked eosinopenia, increase in urinary 17-ketosteroid and uric acid excretion, along with sodium and chloride retention are all indications of such activity.[6] However, it is still not definitely known whether the placenta produces adrenocorticoid substances, whether it stimulates or possibly simulates anterior pituitary activity, or whether a combination of such mechanisms is in action.

While urinary estrogen excretion rises throughout normal pregnancy, substantially decreased values are found in toxemias.[7] Whether this change is associated with an increase in estrogen-oxidation products has not been determined. These oxidation products are known to stimulate anterior-pituitary

1. Darrow, D. C.; and Pratt, E. L.: Fluid Therapy; Relation to Tissue Composition and Expenditure of Water and Electrolyte; Council on Foods and Nutrition. J.A.M.A., **143**: 365-373 (May 27) 1950; 432-439 (June 3) 1950.

2. Hench, P. S.: Ameliorating Effect of Pregnancy on Chronic Atrophic (Infectious Rheumatoid) Arthritis, Fibrositis, and Intermittent Hydrarthrosis. Proc. Staff Meet., Mayo Clin., **13**:161-167 (March 16) 1938.

3. Hench, P. S.; Kendall, E. C.; Slocumb, C. H.; and Polley, H. F.: The Effect of a Hormone of the Adrenal Cortex (17-hydroxy-11-dehydrocorticosterone: Compound E) and of Pituitary Adrenocorticotropic Hormone on Rheumatoid Arthritis; Preliminary Report. Proc. Staff Meet., Mayo Clin., **24**:181-197 (April 13) 1949.

4. Jailer, J. W.; and Knowlton, A. I.: Simulated Adrenocortical Activity during Pregnancy in Addisonian Patient. J. Clin. Investigation, **29**:1430-1436. (Nov.) 1950.

5. Johnson, R. H.; and Haines, W. J.: Extraction of Adrenal Cortex Hormone Activity from Placental Tissue. Science, **116**:456-457 (Oct. 24) 1952.

6. Hofbauer, J.; Cited by Dieckman, W. J.: The Toxemias of Pregnancy. 2nd ed. p. 341. St. Louis: C. V. Mosby Company, 1952.

7. Smith, G. V.; and Smith, O. W.: Excessive Gonad-Stimulating Hormone and Subnormal Amounts of Oestrin in Toxemias of Late Pregnancy. Amer. J. Physiol., **107**:128-145 (January) 1934.

activity.[1] Further, the urinary gonadotropin levels of toxemias are markedly elevated over those found during normal pregnancy. It is thought that at least some of the increase in gonadotropin production during pregnancy may be accomplished by the placenta.

From presently available data the exact mechanism initiating the increased hormonal activity during toxemias cannot be delineated, but it can readily be seen that a disturbance of the normal delicate balance of certain hormonal regulatory mechanisms occurs. Certainly, further investigation along this line is indicated. Only after such data are accumulated can a coherent interpretation be reached concerning the pathophysiology present in this syndrome.

1. Smith, G. V.; and Smith, O. W.: Urinary Excretion of Estrogenic and Gonadotropic Hormones during Menstrual Cycles, Period of Conception and Early Pregnancy. New England J. Med., 215:908-914 (Nov. 12) 1936.

CARDIAC ARREST

Cardiac standstill under anesthesia is a serious problem currently receiving increasing attention. Use of multiple anesthetic agents in surgical patients with ensuing physiological disturbances has been blamed for the recent increase in frequency of this complication. Anoxia and vagal stimulation are other factors often implicated.

Though its cause and prevention are not yet clear, certain points in early diagnosis and rapid resuscitation have become well established. The anesthetist is primarily responsible for immediately recognizing the cessation of pulse and respiration and the absence of blood pressure. The surgeon must drop everything else and immediately confirm the diagnosis and institute treatment. Confirmation is obtained by palpating the nearest large artery and by listening with the unaided ear over the precordium; there is no time to obtain a stethoscope.

Intra-cardiac injection of epinephrine without opening the chest, and cardiac massage through the diaphragm are too often ineffective to justify the time it takes to carry them out. Irreversible brain damage occurs in three and one-half minutes without cerebral blood flow. Heart beat may be restored after longer periods of asystole, leaving a tragic, decerebrate animal who may linger for weeks or months before death. The only truly effective therapy at present is thoracotomy and manual cardiac massage at 60 strokes per minute. This usually restores the heart beat in a few minutes and maintains adequate cerebral blood flow in the interim. Direct intraventricular injection of epinephrine or calcium chloride followed immediately by massage is even more effective since these drugs are powerful myocardial stimulants if they are massaged out into the coronary circulation.

The responsibility for resuscitation rests squarely on the shoulders of the operating physician, whether he be a gynecologist, orthopedist, ophthalmologist or general surgeon. There is seldom time to call a thoracic or general surgeon from an adjacent room or floor. It is therefore mandatory that all physicians who deal with patients under anesthesia familiarize themselves with this simple, effective technic, if the incidence of successful resuscitation is to be increased.

TWENTY-FIVE YEARS AGO

From Journals of 1928

Physiology of Rage.[1]—In 1896, when I was a first year medical student, Professor Henry P. Bowditch . . . invited me to make use of the then newly discovered Roentgen rays in a study of the activities of the alimentary canal. . . . The smooth running recurrent waves of peristalsis . . . were promptly abolished when the subject showed signs of anxiety, distress, or rage. It was evident that these alimentary functions were extremely sensitive to emotional disturbances. . . . Although physicians have not infrequent occasions to observe instances of functional disturbances due to emotional excitement, there is an inclination to minimize or slight that influence, or even to deny that it is part of a physician's service to his patient to concern himself with such troubles. Let the patient go to the clergyman for comfort and consolation and for the resolution of his deep anxieties. . . . Any state which has no distinct "pathology" appears to be unreal or of minor significance. . . .

What is an emotion? The signs of rage include the crouching body, the moist or frowning brow, the firm lips, the clinched or grinding teeth, the growled threats or imprecations, the tightened fists or the seized weapon ready for an attack. . . .

1. Cannon, W. B.: The Mechanism of Emotional Disturbances of Bodily Functions. New England J. Med., 198:877 (June 14) 1928.

Britton and I, using cats as subjects, undertook an investigation of some of the effects of decortication which left intact almost all of the gray masses at the base of the brain. As soon as recovery from anesthesia was complete a remarkable group of activities appeared, such as are usually seen in an infuriated animal . . . a sort of sham rage . . . appeared to result from the restraint . . . including lashing of the tail, arching of the trunk . . . display of the claws . . . snarling and attempts to bite . . . erection of the tail hairs, high blood pressure, a very rapid heart beat, increase of blood sugar up to five or six times the normal. . . . Where among these basal ganglia does the neurone pattern for the rage response reside? . . . The extirpation of the posterior half of the diencephalon promptly abolishes the spontaneous activity. . . . The nervous organization for the display of rage . . . is located in an ancient portion of the brain, the optic thalamus which is a part of the diencephalon. This region is not like the cerebral cortex where new adjustments with the outer world are constantly being made or modified. . . . Indeed it is like the spinal cord, a place where the simpler mechanism for orderly motions resides and where stimulation evokes fixed and uniform reflex responses. . . .

Emotional habit reaction should be prevented by prompt treatment . . . the cortex has no direct control over the functions of the viscera. It is useless, therefore, to try to check a racing heart or to lower a high blood pressure, or to renew the activities of an inhibited digestive system by a coldly reasoned demand for different behavior . . . the factors in the whole situation which are the source of strong feeling must be discovered and either explained away or eliminated. . . .

I have tried to indicate the ways in which the functions of the body may be upset by the mural processes which are associated with emotions. I hope that I have convinced you that interest in this realm of medicine should not be relegated to cults, mental healers and the clergy. The doctor . . . should have . . . a natural interest in the effects of emotional stress and in the modes of relieving it.

Cancer and Heredity.[1]—For the past nineteen years I have been making an exhaustive study of . . . the relation of heredity to predisposition to cancer and exemption from cancer, with all its related problems. . . . Mice were selected for this work . . . very many generations can be studied in the life time of one worker. . . . All conclusions have been based upon numbers so large as to be beyond all possibility of coincidence . . . to date over 67,000 necropsies have been done including between 5,000 and 6,000 primary spontaneous neoplasms. . . . These cancers are not caused by any experimental procedures . . . they are spontaneous cancers arising in the natural life of the animals, exactly as man's spontaneous cancers arise. . . .

The tendency to be susceptible to cancer is . . . inherited as a recessive character. . . . By the successive mating of dominant non-cancerous mice with hybrid non-cancerous mice, cancer has been held off indefinitely but has still been present potentially. . . . When in any generation, the second, the third, the nth, two hybrid non-cancerous mice have been mated, cancer has appeared in the next generation in almost mendelian ratio. In the studies in this laboratory cancer has been held off for twenty-five generations by persistently mating analyzed dominant non-cancer with hybrid carriers. . . . But when eventually two . . . hybrid carriers were mated, cancer has appeared in the next generation . . . it might prove to be possible . . . to eliminate cancer from families of man . . . there is in man the beginning of a genetic sense (that is a sense for the fitness of matings) . . . the problem of founding correct human cancer archives is a difficult one. . . . I am here to beg that a committee of your organization be appointed to consider ways and means by which permanent scientific human cancer archives can be founded.

1. Slye, Maud: Cancer and Heredity. Annals Int. Med., 1:951 (June) 1928.

Book Reviews

Pediatrics in General Practice. By James G. Hughes, B.A., M.D., Professor of Pediatrics, University of Tennessee, College of Medicine, Memphis, Staff Member of the John Gaston Children's Hospital and the Le Bonheur Children's Hospital. First Edition. 735 pages with illustrations. New York: McGraw-Hill Book Company, Inc., 1952. Price $14.00.

For an author to invade such a well covered field as pediatrics with a new book, presupposes the conviction that he has a new approach to a group of readers and that he has the qualifications to meet their needs. The reviewer is willing to concede this premise since the author in addition to teaching pediatrics in a medical school has been conducting seminars in pediatrics for practising physicians for many years. This latter experience has familiarized him with the gap that exists between the frame of reference of the present day medical student and that of the graduate of several years back. He has the responsibility of bringing into focus the advances in pediatrics that have been made in the intervening years which have important application in every day practice. In accomplishing this he forsakes his ivory tower and returns to the seminar which gives the book the air of intimate instruction. An illustration of this point is the chapter on fluids and electrolyte balance which is a simplified explanation, in text and tables, of the causes, the clinical forms and the methods of correction of dehydration, acidosis and alkalosis. This difficult subject has been covered clearly and adequately.

The chapter on the newborn comes directly from the delivery room and nursery where the emergencies that occur at this most hazardous period of the infant's life are discussed and treatment is recommended with an air of competent familiarity. The seventy-seven pages devoted to the newborn show the author's insight into the need of the practising physician for

complete coverage of this period. Recognizing the impact of social maladjustments that have their origin in infancy and childhood, the author devotes an excellent chapter to the prodromata of adult instability. He presents the technics that may be used by the practising physician and ends with illustrative case reports. It would seem that in this chapter, Dr. Hughes, in removing some of the aura of mystery with which many physicians regard psychological problems is pleading with him to assume his responsibility to guide his little patients along the path of future mental health and happiness.

The three chapters discussed to exemplify the new approach represent a fourth of the general sections, all of which should receive high commendation.

Clinical Allergy. By French K. Hansel, M.D., M.S., Director, Hansel Foundation for Education and Research in Allergy, Chief of Allergy Service, DePaul Hospital, St. Louis, Missouri. 1,005 pages with 86 illustrations and 3 color plates. St. Louis: The C. V. Mosby Company, 1953. Price $17.50.

This book presents a comprehensive exposition of the manifestations of allergy in the human subject. An outgrowth and development of the author's earlier work, *Allergy of the Nose and Paranasal Sinuses*, published in 1936, the volume is now aimed not only to appeal to specialists in allergy and otolaryngology, but also to assist the general practitioner and to serve as a useful reference for specialists in relevant fields, such as dermatology and pediatrics.

Starting with an introduction on the terminology and history of allergy, the book is divided into 53 chapters, dealing with such subjects as allergy to biologic products, allergy to drugs, foods as allergens, the pollens in hay fever, history taking and diagnosis, nose and paranasal sinuses, bronchial asthma, the antihistamines, ACTH and cortisone, dermatologic manifestations of allergy, and cerebral allergy, allergic headache, and migraine. Five chapters deal fully with allergy in children: its causes and prevention, respiratory manifestations, paranasal sinuses, gastro-intestinal and other manifestations, and dermatoses.

In many areas, regrettably, the volume emerges rather as a compilation than as a fresh and personal work. It suffers from repetitiousness and prolixity. Conscientious editing could have condensed the book, enhancing its worth to the reader. It is a greater virtue for an author to be critical and eclectic than to attempt ambitiously a widely inclusive presentation of the modern literature of allergy. The format and typography of the book are a magnificent representation of the printer's art; doubly unfortunate is it therefore that a number of errors in spelling escaped the proof-reader's vigilance.

As might be anticipated, the book is unexcelled on the subject of allergy of the nose and the paranasal sinuses. It is weakest in the sections on dermatologic allergy. It contains a fine index, a glossary, and extensive bibliographies at the close of each chapter, and it reproduces pollen survey tables, food lists and hosts of other specialized data that should prove useful indeed to everyone interested in the subject. In general, the basically sound organization of the material and the practical approach make the book a valuable reference for the practitioner, a refresher for the specialist, and a guide for the student.

Gynecologic and Obstetric Pathology. With Clinical & Endocrine Relations. By Emil Novak, A.B., M.D., D.Sc. (Hon., Trinity College, Dublin; Tulane), F.A.C.S., F.R.C.O.G. (Hon.), Assistant Professor Emeritus of Gynecology, The Johns Hopkins Medical School. Third Edition. 595 pages with 630 illustrations, 19 in color. Philadelphia: W. B. Saunders Company, 1952. Price $10.00.

This third edition is even better than the others, in that it is more comprehensive, more up-to-date and has more illustrations.

It is a text of pathology written from the clinician's viewpoint, and has a proportioning satisfactory at once to the clinician and pathologist. For medical teaching, it is excellent in that the material is comprehensive, accurate, and so written as to neither frighten the junior student nor to relax the experienced teacher.

Five years of intensive, critical observation has allowed the author to rewrite the chapters on carcinoma of the cervix, especially carcinoma *in situ*, ovarian tumors, hydatidiform mole and chorionepithelioma malignum with extraordinary understanding.

There is a new chapter concerned with common breast lesions, which is very short and less invigorating than most of the text.

This is an excellent, readable book for any physician who treats women.

Textbook of Paediatrics. By Fanconi and Wallgren. Edited by W. R. F. Collis, M.A., M.D., F.R.C.P., F.R.C.P.I., D.P.H., Lecturer in Paediatrics, Dublin University; Dublin. 1,104 pages with illustrations. New York: Grune & Stratton, 1952. Price $19.50.

This is a comprehensive text book presented in a slightly different manner from that of the standard American texts. The photographs, both black and white and color, are not excelled by any texts, particularly the photographs of skin lesions. The chapter on acute infectious disease is adequately presented, although in almost every case the therapy is antiquated. The discussion of the endocrine glands, in particular the adrenal and its hormones is not so complete as in the American texts. The chapter on tuberculosis is excellent and has many fine x-rays.

The clinical description of the cases is outstanding. The text is better suited for the practising physician than for the student or house office.

Textbook of Surgery. Edited by H. F. Moseley, M.A., D.M., M.Ch. (Oxon), F.A.C.S., F.R.C.S. (Eng.), F.R.C.S. (C), Assistant Professor of Surgery, McGill University; Montreal, Canada. 896 pages with 460 illustrations and 46 color plates. St. Louis: The C. V. Mosby Company, 1952. Price $15.00.

This well written text represents the cooperative

efforts of the younger surgical staff members of the Royal Victoria Hospital. No attempt has been made to cover in detail the fields of anatomy, physiology and pathology. Rather, there is close integration of each of these basic sciences in the text.

This work is profusely illustrated with excellent photographs and drawings.

Sections on eye, ear, nose and throat and gynecology (aside from that required in the differential diagnosis of abdominal conditions) have been purposely omitted since separate books are available in these subjects.

This is an up-to-date, authoritative volume designed primarily for the medical student but of real value to all surgeons.

The Human Pelvis. By Carl C. Francis, A.B., M.D., Assistant Professor of Anatomy, Department of Anatomy, Western Reserve University, Cleveland, Ohio. 210 pages, with 61 illustrations, 3 in color. St. Louis: The C. V. Mosby Company, 1952. Price $5.50.

This little book represents one of the few attempts to give a brief discussion of the human pelvis. It forms quite a complete text. The material on the bones of the pelvis, the pelvic articulation and measurements are well treated. The muscular system is well presented and well illustrated, although the material concerning the fascia of the pelvis is rather short. The latter may be an advantage as it does away with much of the conflicting material, literature, and the confusing synonymous terminology. The vascular supply and the nerve supply of the pelvis and the pelvic viscera is perhaps too briefly covered. There is no mention of the variations that occur in the great vessels that enter and supply the pelvis and the very difficult autonomic nervous system of the region is much too briefly treated. The viscera of the pelvis are far too briefly treated. The text book material perhaps might better have been restricted purely to the anatomy of the pelvic wall itself, namely: a discussion of the pelvic bones, their articulations, muscles and fascia. The illustrations demonstrate in detail all the material presented in the text. The book forms a very good review of the anatomy of the pelvic structures, and there is a considerable need for it.

An Introduction to Medical Science. An Elementary Text on Pathology. By William Boyd, M.D., Dipl. Psych., M.R.C.P. (Edin.), F.R.C.P. (London), F.R.C.S. (Canada), LL.D. (Sask.), M.D. (Oslo), F.R.S. (Canada), Professor of Pathology, University of British Columbia, Vancouver, B. C., Canada. Fourth Edition. 304 pages with 124 illustrations and 3 colored plates. Philadelphia: Lea & Febiger, 1952. Price $4.50.

This text is eminently suited for nurses, physiotherapists, and others who may require a digestible introduction to the field of medical science.

Within the limits of a modest 300 pages it presents a broad impression of the principles underlying the disease processes and mechanisms of the body.

Rightly, microscopic detail is almost entirely omitted as this can only prove confusing to the beginner. Similarly, illustrations, which are numerous and for the most part well chosen, are confined to gross specimens and general bodily configuration in disease.

The nurse's art is essentially a practical one and the sections on the elements of treatment do well in suggesting the link between bodily change and the curative measures prescribed.

The resume of normal structure and function which prefaces each chapter should prove useful, though one feels that a glossary of medical terms would greatly assist the reader in a study of the text.

Gifford's Textbook of Ophthalmology. Edited by Francis Heed Adler, M.D., Professor of Ophthalmology, University of Pennsylvania Medical School. New 5th Edition. 488 pages with 281 figures and 26 color plates. Philadelphia: W. B. Saunders Company, 1953. Price $7.50.

Emphasis is placed upon giving the student of medicine ophthalmic material for use in the practice of general medicine. The latest accepted therapy is included to bring the physician abreast of the times. The treatment is complete for those diseases which the general physician will treat.

The first four chapters are concerned with methods of examination and should be studied by those who treat eye conditions. Each section is preceded by discussion of the anatomy of the region.

One of the most outstanding sections is on retinal diseases. The effects of hypertension and diabetes on the eye are presented in detail. As Dr. Adler points out, "This is the field of ophthalmology of the most concern to the practicing physician."

Throughout the book the physician is advised as to the cases which he should treat and those which should be seen by or in consultation with an opthalmologist.

The chapter on therapeutics needs revision on cortisone and local anesthetics.

Familial Nonreaginic Food-Allergy. By Arthur F. Coca, M.D., Oradell, New Jersey. Third Edition. 279 pages. Springfield: Charles C. Thomas, Publisher, 1953. Price $10.50.

The third edition of Dr. Coca's book is enlarged and extended by the addition of many new case reports and contributions of several supporting authors. Idioblapsis is the word coined by Dr. Coca to replace the longer title, familial nonreaginic food allergy. It is derived from a combination of two Greek words meaning self-spoiler.

This, Dr. Coca's fifth classification of allergic diseases is characterized chiefly by the fact that foods which are allergenic for an individual are said to cause acceleration of the pulse rate. A footnote on page 131 says that "the idioblaptic pulse character consists in a range of more than 16 beats (usually much more) from the lowest to the highest rate per

minute, in usual activity, and a variation greater than two beats per minute in the daily maximum."

The method in short is to determine, by counting, the usual pulse range during two days of normal activity on the patient's usual diet and then on a day in which foods are consumed one at a time to count the pulse at thirty-minute intervals, three times after the consumption of each food. An increase of 16 beats per minute or more, over the usual range and following the consumption of a food, indicates idioblaptic sensitivity to that food.

In addition to the well known symptoms of allergy Dr. Coca includes canker sores in the mouth, dizziness, nervousness, high blood pressure and hemorrhoids as caused by idioblapsis. His "eight most common culprit foods" consist of wheat, egg, milk, potato, orange, beef, tomato and chocolate. However in a table of frequencies he lists house dust and tobacco above these.

Dr. Coca's insistence on the worthlessness of skin tests for foods is difficult to understand by those who have spent many years making skin tests for foods using allergenic solutions made with the justly famous Coca's solution. The method advised in this book seems too tedious and protracted for wide use.

Human Embryology. Prenatal Development of Form and Function. By W. J. Hamilton, M.D., D.Sc., F.R.S.E., Professor of Anatomy in the University of London at Charing Cross Hospital Medical School; sometime Regius Professor of Anatomy, University of Glasgow; J. D. Boyd, M.A., M.Sc., M.D., Professor of Anatomy in the University of Cambridge; and H. W. Mossman, M.S., Ph.D., Associate Professor of Anatomy in the University of Wisconsin. Second Edition. 432 pages with illustrations, some in color. Baltimore: The Williams & Wilkins Company, 1952. Price $9.00.

The text has been expanded somewhat as an answer to the criticism of excessive brevity of certain topics in the first edition. Many of the illustrations have been redrawn or replaced to facilitate the visualization of this difficult subject. It is regrettable that the publisher did not see fit to divide each page into a double column of print. The new face type is more legible than that previously used. However, it does not completely overcome the criticism of the difficulty of reading the excessively wide columns.

This book is without question one of the best illustrated biological texts available to the English reading scientist and student. Even the beginning student of embryology should not find it difficult to understand the various developmental procedures if the accompanying drawings and diagrams are diligently and intelligently studied. Many of these illustrations are minor modifications of the outstanding drawings which appeared originally in the "Contributions to Embryology" of the Carnegie Institution of Washington. The well qualified illustrators have made invaluable contributions to this text.

The Essentials of Medical Diagnosis. A Manual for Students and Practitioners. By Rt. Hon. Lord Horder, G.C.V.O., M.D., F.R.C.P. (Lond.); Extra Physician to H.M. the Queen; and A. F. Gow, M.D., F.R.C.P. (Lond.); Honorary Physician to Household, H.R.H. the Duchess of Kent. Second Edition revised with the assistance of Ronald Bodley Scott, M.A., D.M. (Oxon), F.R.C.P. (Lond.), Physician to H.M. Household. 462 pages with illustrations. Baltimore: The Williams and Wilkins Company, 1953. Price $6.00.

This is an introduction to the principles of physical diagnosis and contains many valuable discussions on problems of diagnosis arising from positive findings. These include, for instance, the differential diagnosis of headache, coma, abdominal pain, jaundice, and enlargement of the liver. These sections on differential diagnosis are perhaps the most remarkable feature of the book, which otherwise suffers from a lack of clinical illustrations.

In addition to a consideration of the major body systems, there are chapters on diseases of the blood, the joints, the ductless glands, and the skin. Each chapter opens with a succinct review of anatomical and physiological aspects of the organs and tissues concerned. All sections of the new edition have been carefully revised. The authors wisely stress the importance of employing the senses, instead of machines and laboratory tests, in diagnosing disease.

Symptoms and Signs in Clinical Medicine: An Introduction to Medical Diagnosis. By E. Noble Chamberlain, M.D., M.Sc., F.R.C.P., Senior Lecturer in Medicine, University of Liverpool. Fifth Edition. 480 pages with illustrations. Baltimore: The Williams and Wilkins Company, 1952. Price $8.00.

The reader is given the principles of physical diagnosis through a consideration of the more common signs and symptoms. The discussion proceeds according to organ systems, which is less customary than an arrangement according to anatomical regions. Introductory chapters on history taking and external signs of disease are followed by chapters on the respiratory, cardiovascular, urinary, digestive, hemopoietic, and nervous systems. Only very brief mention is made of gynecologic examination.

Special sections are devoted to the subjects of fever; the problems encountered in the examination of children; several diagnostic operative procedures; basic aspects of radiology; and to some simple chemical and clinico-pathological tests. A few of the more important diseases pertaining to the system in question are taken up in each chapter, and this should be very helpful in correlating clinical observations with the eventual object of making a diagnosis. The book is also distinguished by its many illustrations, all of excellent quality. In this new edition, each chapter has undergone revision, and a glossary of medical terms has also been added. This volume is chiefly directed to meet the needs of the student, but many a doctor will find it worth his time, particularly the sections on examination of the nervous system.

Books Received

The Good Doctor. And Other Selections From the Essays and Addresses of William de Berniere MacNider, late Kenan Research Professor of Pharmacology, University of North Carolina. Edited by William W. McLendon and Shirley Graves Cochrane. 179 pages. Chapel Hill: The University of North Carolina Press, 1953. Price $5.00.

The Founders of Neurology. One Hundred and Thirty-Three Biographical Sketches. Prepared for the Fourth International Neurological Congress in Paris. By Eighty-Four Authors. Edited by Webb Haymaker, M.D., Chief, Neuropathology Section, Armed Forces Institute of Pathology, Washington, D. C. With the bibliographical and editorial assistance of Karl A. Baer, Bibliographer, Army Medical Library, Washington, D. C. 479 pages. Springfield, Illinois: Charles C. Thomas, Publisher, 1953. Price $10.50.

The Normal Child. Some Problems of the First Three Years and their Treatment. By Ronald S. Illingworth, M.D. (Leeds), F.R.C.P. (Lond.), D.P.H., D.C.H., Professor of Child Health, The University of Sheffield, Pediatrician to The Children's Hospital Unit and The Jessop Hospital for Women, The United Sheffield Hospitals. First Edition. 342 pages with 64 illustrations. Boston: Little, Brown and Company, 1953. Price $6.00.

Modern Medical Monographs. Chronic Pulmonary Emphysema. Physiopathology and Treatment. By Maurice S. Segal, M.D., Clinical Professor of Medicine, Tufts College Medical School; M. J. Dulfano, M.D., Resident, Department of Inhalation Therapy, Boston City Hospital; 180 pages. New York: Grune and Stratton, Inc., 1953.

Physical Examination of The Surgical Patient. By J. Englebert Dunphy, M.D., F.A.C.S., Associate Clinical Professor of Surgery, Harvard Medical School; Surgeon, Peter Bent Brigham Hospital; Consultant in Surgery, Children's Medical Center; and Thomas W. Botsford, M.D., F.A.C.S., Clinical Associate in Surgery, Harvard Medical School; Senior Associate in Surgery, Peter Bent Brigham Hospital; Associate in Surgery, Children's Medical Center. 326 pages with illustrations. Philadelphia and London: W. B. Saunders Company, 1953. Price $7.50.

The Roentgen Aspects of The Papilla and Ampulla of Vater. By Maxwell H. Poppel, M.D., F.A.C.R., Professor of Radiology, New York University Post-Graduate Medical School, Roentgen Ray Department, Bellevue Hospital; Harold G. Jacobson, M.D., F.A.C.R., Director, Department of Roentgenology, Hospital for Special Surgery, Associate Clinical Professor of Radiology, New York University Post-Graduate Medical School, New York, New York; and Robert W. Smith, M.D., Senior Resident in Radiology, Veterans Administration Hospital, Bronx, New York. 211 pages, 150 illustrations. Springfield, Illinois: Charles C. Thomas, Publisher, 1953. Price $8.50.

Sacral Nerve-Root Cysts. Another Cause of the Sciatic or Cauda Equina Syndrome. By I. M. Tarlov, M.D., Professor of Neurology and Neurosurgery, New York Medical College, New York City. 134 pages with illustrations. Springfield, Illinois: Charles C. Thomas, Publisher, 1953. Price $6.50.

Contact Dermatitis. By George L. Waldbott, M.D., F.A.A.A., F.A.C.A., F.I.A.A., F.A.C.P., Senior Physician, Harper Hospital, Chief of Division of Allergy, Grace Hospital, Detroit, Michigan. Edited by Arthur C. Curtis, M.D., Chairman, Department of Dermatology and Syphilology, University of Michigan, Ann Arbor, Michigan. 218 pages with illustrations. Springfield, Illinois: Charles C. Thomas, Publisher, 1953. Price $8.75.

The Roots of Psychotherapy. By Carl A. Whitaker, M.A., M.D., Professor of Psychiatry and Chairman of the Department of Psychiatry, Emory University School of Medicine; and Thomas P. Malone, M.A., Ph.D., Assistant Professor of Psychiatry and Director of Research, Department of Psychiatry, Emory University School of Medicine. 236 pages. New York: The Blakiston Company, 1953. Price $4.50.

Diseases of Children. Previous Editions edited by Sir A. E. Garrod, K.C.M.G., D.M., F.R.S.; Frederick E. Batten, M.D., M.A., F.R.C.P.; and Hugh Thursfield, D.M., M.A., F.R.C.P.; Edited by Alan Moncrieff, C.B.E., M.D., F.R.C.P., Nuffield Professor of Child Health, University of London; and Philip Evans, M.D., M.Sc., F.R.C.P., Physician to the Children's Department and Director of the Department of Child Health, Guy's Hospital, Physician, The Hospital for Sick Children, Great Ormond Street. Fifth Edition. Volumes I and II. Volume I, 1014 pages, Volume II, 1973 pages with illustrations. Baltimore: The Williams and Wilkins Company, 1953. Price $21.00.

Modern Concepts of Leprosy. By Harry L. Arnold, Jr., M.D., F.A.C.P., Department of Dermatology, Straub Clinic, Honolulu, Hawaii; A Monograph in American Lectures in Dermatology. Edited by Arthur C. Curtis, M.D., Chairman, Department of Dermatology and Syphilology, University of Michigan, Ann Arbor, Michigan. Publication Number 145. 105 pages with illustrations. Springfield, Illinois: Charles C. Thomas, Publisher, 1953. Price $3.75.

The Psychology and Psychotherapy of Otto Rank. An Historical and Comparative Introduction. By Fay B. Karpf, Ph.D., Author of American Social Psychology: Its Origins, Development, and European Background. 129 pages. New York: Philosophical Library, 1953. Price $3.00.

Dermatology in General Practice. By Jacob Hyams Swartz, M.D., Assistant Professor of Dermatology, Harvard Medical School and Post-graduate School; by C. Guy Lane, M.D., Professor Emeritus, Department of Dermatology, Harvard Medical School. 581 pages with illustrations. Baltimore: The Williams and Wilkins Company, 1953. Price $11.00.

Influenza And Other Virus Infections of the Respiratory Tract. By C. H. Stuart-Harris, M.D., F.R.C.P., Professor of Medicine, University of Sheffield. With a Foreword by C. H. Andrews, M.D., F.R.C.P., F.R.S., Deputy Director, National Institute for Medical Research. 235 pages with illustrations. Baltimore: The Williams and Wilkins Company, 1953. Price $6.00.

A Modern Practice of Obstetrics. By D. M. Stern, M.A., M.B., B.Ch. (Cantab.), F.R.C.S., F.R.C.O.G., Obstetrics and Gynaecological Surgeon, West Middlesex Hospital and its annexes; and C. W. F. Burnett, M.D. (Lond.), F.R.C.S., F.R.C.O.G., Obstetric and Gynaecological Surgeon, West Middlesex Hospital and its annexes. 248 pages with illustrations. Baltimore: The Williams and Wilkins Company, 1952. Price $7.00.

Sympathetic Control of Human Blood Vessels. By H. Barcroft, M.A., M.D., M.R.C.P., Professor of Physiology, St. Thomas's Hospital Medical School, London; and H. J. C. Swan, Ph.D., M.B., M.R.C.P., Formerly Lecturer in Physiology, St. Thomas's Hospital Medical School, London, Research Associate, Mayo Clinic, Rochester, Minnesota. 165 pages with illustrations. Baltimore: The Williams and Wilkins Company, 1953. Price $3.75.

Clinical Cardiology. Edited by Franklin C. Massey, A.B., M.D., Assistant Professor of Medicine, Hahnemann Medical College, Philadelphia, Pennsylvania. 1100 pages with 250 illustrations. Baltimore: The Williams and Wilkins Company, 1953. Price $13.50.

Tumors of The Orbit and Allied Pseudo Tumors. An Analysis of 216 Case Histories. By Raymond G. Ingalls, M.D., Formerly, Instructor in Ophthalmology, College of Physicians and Surgeons, Columbia University; Formerly, Assistant Ophthalmologist, Presbyterian Hospital and Vanderbilt Clinic; Formerly, Assistant Eye Pathologist, Institute of Ophthalmology, Presbyterian Hospital in the City of New York. 410 pages with illustrations. Springfield, Illinois: Charles C. Thomas, Publisher, 1953. Price $11.50.

An Atlas of the Commoner Skin Diseases. By Henry C. G. Semon, M.A., D. M. Oxon., F.R.C.P., London; Consulting Physician for Diseases of the Skin, and former Lecturer to Postgraduates, Royal Northern Hospital; Consulting Dermatologist, Hampstead and North-West London General Hospital. Fourth Edition. 370 pages with illustrations. Baltimore: The Williams and Wilkins Company, 1953. Price $13.50.

Diuretic Therapy. The Pharmacology of Diuretic Agents and the Clinical Management of the Edematous Patient. By Alfred Vogl, M.D., Assistant Professor of Clinical Medicine, New York University College of Medicine; Associate Visiting Physician, Third Medical Division Bellevue Hospital; Associate Visiting Physician, Medical Division Metropolitan Hospital, New York City. With a Foreword by Arthur M. Fishberg, M.D. 248 pages. Baltimore: The Williams and Wilkins Company, 1953. Price $5.00.

The Epidemiology of Health. A New York Academy of Medicine Book. Edited by Iago Galdston. 197 pages. New York: Health Education Council (10 Downing Street) 1953. Price $4.00.

The Physician in Atomic Defense. Atomic Principles, Biologic Reaction, and Organization for Medical Defense. By Thad P. Sears, M.D., F.A.C.P., Associate Clinical Professor of Medicine, University of Colorado School of Medicine; Chief of Medical Service, Veterans Administration Hospital, Denver; Member of Advisory Staff to Director of Civil Defense, State of Colorado; Member of Disaster Commission, Colorado State Medical Society; Colonel (M.C.), U.S.A.R. With a Foreword by James J. Waring, M.D., M.A.C.P., Professor of Medicine, University of Colorado School of Medicine. 308 pages. Chicago: Year Book Publisher, Inc., 1953. Price $6.00.

Southern Medical News

ALABAMA

Medical College of Alabama, Birmingham, has been awarded $17,280 by the Life Insurance Medical Research Fund of New York for research by Dr. Tinsley R. Harrison on the subject of intra-cellular and extra-cellular distribution of sodium in heart failure and on precordial movements.

Dr. Joseph M. Donald, associate professor of surgery, Medical College of Alabama, Birmingham, has been elected a member of the American Surgical Association, an organization limited to 200 outstanding surgeons in the United States and Canada. Other Birmingham members are Dr. Champ Lyons, Dr. James M. Mason III, and Dr. Earle Drennen.

A new five-story $300,000 cancer research laboratory will be constructed on the grounds of the Southern Research Institute, Birmingham, as soon as plans are completed and it is hoped the building will be ready for occupancy by January 1954. The laboratory is being made possible through a grant of $200,000 from the Charles F. Kettering Foundation and $100,000 from the Robert E. Meyer Foundation of Birmingham. It will be affiliated with the Sloan-Kettering Institute for Cancer Research of New York, which is the world's largest cancer research center.

ARKANSAS

Dr. Euclid M. Smith, Hot Springs National Park, has been appointed to the Board of the State Hospital for Nervous Diseases.

Dr. A. A. Hughes has located at Conway.

Dr. Gilbert D. Jay III has been named "Man of the Year" at West Memphis.

Dr. Henry Durst has located at Caraway for the practice of medicine.

Dr. H. K. Baldridge has joined the Saltzman Clinic, Mountain Home.

Dr. L. D. Massey, Osceola, has been named "Man of the Year" by the local Chamber of Commerce.

Dr. V. D. Smith is associated with Dr. Eli Gary, Arkadelphia.

Dr. B. T. Johnson has joined the Crawley-Cogburn Clinic, Forrest City.

DISTRICT OF COLUMBIA

George Washington University School of Medicine, Washington, has received a renewal grant of $10,000 from the Lasdon Foundation to promote further research in the field of tuberculosis. Dr. Monroe J. Romansky, associate professor of medicine, and Dr. Sol Katz, adjunct clinical professor of medicine of the School, are directors of the research program.

Washington Hospital Center, Inc., Washington, has elected new board directors, each of the three participating hospitals, Emergency, Garfield and Episcopal represented by nine directors: One-year terms: Dr. John Minor (Emergency), Dr. William L. Howell (Garfield), Dr. Harold Krogh, dental surgeon (Episcopal); two-year terms: Dr. John H. Lyons (Emergency), Dr. J. Ogle Warfield (Garfield), Dr. G. Victor Simpson (Episcopal); three-year terms: Dr. Robert E. Moran (Emergency), Dr. Howard P. Parker (Garfield), Dr. Aubrey D. Fisher (Episcopal).

Baltimore-Washington Dermatological Society has elected Dr. James Q. Gant, president; and Dr. Jack L. Derzavis continues as secretary-treasurer.

Dr. Wallace M. Yater, president of the Medical Society of the District of Columbia, Washington, is one of six Georgetown University alumni who were honored at the third annual Awards Luncheon of the Georgetown Alumni Club recently. The awards were made for "distinguished service rendered to our country, our city, and our alma mater."

Dr. Samuel M. Dodek, Washington, has been appointed to the editorial council of the *American Journal of Proctology* as an adviser in the allied field of gynecology. This journal is the official publication of the International Academy of Proctology.

Dr. Robert C. Hawkins II has moved from Washington to Toledo, Ohio.

Dr. John M. Baber, formerly of Washington, is practicing in West Palm Beach, Florida.

Dr. James K. Shafer, Washington, who has served as assistant chief of the Public Health Service's Division of Venereal Disease since 1950, has been elevated to the post of chief. He succeeds Dr. Theodore J. Bauer, who recently became Medical Officer in Charge of the Public Health Service's Communicable Disease Center, Atlanta, Georgia.

Dr. Martin M. Cummings, formerly chief of tuberculosis research, Veterans Administration Hospital, Atlanta, Georgia, has been appointed as chief of the research division of the Veterans Administration Department of Medicine and Surgery.

Dr. Marcolino Gomes Candau of Brazil, assistant director of the Pan American Sanitary Bureau, Washington, has been nominated by the World Health Organization Executive Board as the new director-general of the organization to succeed Dr. Brock Chisholm, who will retire July 21.

FLORIDA

Metropolitan Miami Dermatological Society, a newly-formed organization, has chosen Dr. Wiley M. Sams, chairman; Dr. Rothwell Lefholz, vice-chairman; and Dr. Bruce M. Esplin, secretary-treasurer.

The Southern Society of Cancer Cytology has been formed and two meetings held by physicians interested in cancer cytology study, as announced by Dr. Franz H. Stewart, Miami. Dr. F. Bayard Carter, professor of obstetrics and gynecology, Duke University School of Medicine, Durham, North Carolina, is president.

Dr. Paul S. Roland (Lt. Col., MC, USAR), Miami Beach, has been elected president of the newly installed Miami USAR Chapter of the Reserve Officers Association.

Dr. Joshua M. Price, Live Oak, was honored recently for his nearly 50 years of service to Suwannee County by a celebration followed by a program and picnic lunch. A memorial will be erected on the hospital grounds dedicated to Dr. Price, and a framed picture of him will be made and presented to him.

Dr. Charles A. Murray, Orlando, has opened an office there for the practice of urology.

Dr. Paul F. Hutchins, Jacksonville, has returned to his practice after a year's graduate work in Basic Sciences and Adult Rehabilitation at the Ochsner Clinic, New Orleans, Louisiana.

Drs. W. Tracy Haverfield, Miami, William H. McCullagh, Jacksonville, Luther C. Fisher, Jr., Pensacola, and William H. Grace, Fort Myers, are among seventeen persons appointed on a citizens committee to study Florida's mental health problems and recommend improvements in the state's facilities and methods of treating the mentally ill.

Dr. Ira C. Evans, St. Petersburg, has accepted the post of Pinellas County Medical Examiner. Drs. James O. Norton, Dunedine, and Paul F. Wallace, St. Petersburg, will serve as assistants.

Dr. J. Maxwell Williams, Jr., Tampa, has returned to his practice after attending Johns Hopkins Society meetings in Baltimore, Maryland, and study at the Heart Station.

Dr. Leroy H. Oetjen, Leesburg, has returned to his practice after attending a course in the Medical Aspects of Atomic Energy at the Naval Medical Hospital, Bethesda, Maryland.

Dr. Bernard L. N. Morgan, Jacksonville, has opened an office for the practice of plastic surgery.

Miami Obstetrical and Gynecological Society at a recent meeting voted a gift of $1,000 to the new University of Miami Medical School fund.

Dr. W. Tracy Haverfield, Miami, addressed the staff of the Gorgas Hospital while he and Mrs. Haverfield were in the Republic of Panama.

The University of Miami School of Medicine and the Jackson Memorial Hospital, Miami, announce the joint appointment of Dr. Jacques S. Gottlieb as professor of psychiatry at the School of Medicine and director of the Psychiatric Unit of Jackson Memorial Hospital, effective July 1. Dr. Gottlieb has been associate professor of psychiatry at the University of Iowa College of Medicine, Iowa City, since 1947.

Dr. W. Glen Moss recently assumed duties with the University of Miami School of Medicine as associate professor of physiology, coming to Miami from the University of Illinois School of Medicine.

Dr. W. A. D. Anderson, educated in Canada, and recently director of the department of pathology, Marquette University School of Medicine, and director of the Pathology Laboratories, St. Joseph's Hospital, Milwaukee, Wisconsin, will assume duties about the middle of the summer as chairman of the department of pathology, University of Miami School of Medicine, and director of the Pathology Laboratories, Jackson Memorial Hospital, Miami. He has appointed Dr. Philipp Rezek as professor of pathology for the medical school, and Dr. Virgil Moon as research professor of pathology.

Variety Children's Hospital, Miami, has a new $135,000 two-story wing which was dedicated recently on the hospital's third anniversary. This wing increased the hospital's bed capacity from 117 to 157 and added 40 contagious beds.

Dr. Philipp Rezek, Miami, has been appointed by the College of American Pathologists to serve on the Committee on Forensic Pathology.

Continued on page 36

for your
peptic ulcer
patients...

Antrenyl T.M.
bromide
OXYPHENONIUM BROMIDE CIBA

New High Potency
Anticholingeric with
No Bitter Aftertaste

As adjunctive therapy in your standard peptic ulcer regimen*, Antrenyl offers potent anticholinergic action to inhibit motility of the gastrointestinal tract and gastric secretion.

Although Antrenyl is one of the most potent of all anticholinergic agents, it rarely causes esophageal or gastric irritation and has no bitter aftertaste. In individualized doses, it is well tolerated and side effects are absent or generally mild.

In one study[1] patients receiving Antrenyl obtained relief from acute symptoms within 24 to 36 hours. Dosage was individually adjusted at 5 to 10 mg. four times a day. Side effects were adjudged less pronounced than those of other similar agents ordinarily used in the management of peptic ulcer.

Prescribe Antrenyl in your next case of peptic ulcer and spasm of the gastrointestinal tract. Available as tablets, 5 mg., scored, bottles of 100; and syrup, 5 mg. per teaspoonful (4 cc.), bottles of 1 pint.

Ciba Pharmaceutical Products, Inc., Summit, N. J.

Leading gastroenterologists recommend:

rest
sedation
antacids
nonirritating diet
anticholinergics

Ciba

1. Rogers, M. P., and Gray, C. L.: *Am. J. Digest. Dis.* 19:180, 1952.

2/ 18958M

"We...give Depropanex routinely to all our patients following operations"[1]

When DEPROPANEX *is used routinely following abdominal surgery, "Rarely do we resort to the nasal suction apparatus, and since there is very little vomiting we do not need to resort to intravenous feedings."*[1]

Depropanex®

SHARP & DOHME

DEPROTEINATED PANCREATIC EXTRACT

Non-narcotic Prevention or Relief of Pain due to Smooth Muscle Spasm.

DEPROPANEX has been widely employed for relief of renal and ureteral colic, and other painful conditions involving smooth muscle spasm. When administered following abdominal surgery, this physiologic agent is most effective in maintaining "uniformly good tone to the bowel all through the postoperative period."[1]

In the treatment of intermittent claudication, "if adequate doses of DEPROPANEX do not increase the distance which the patient can walk before he has pain it is improbable that anything will."[2]

DEPROPANEX is non-narcotic and nontoxic. Unlike morphine, which simply blocks cerebral recognition of pain, DEPROPANEX acts directly on smooth muscle tissue. It is a deproteinated saline solution of a chemically derived, protein-free, nitrogenous fraction obtained from an acid-alcohol treatment of mammalian pancreas.

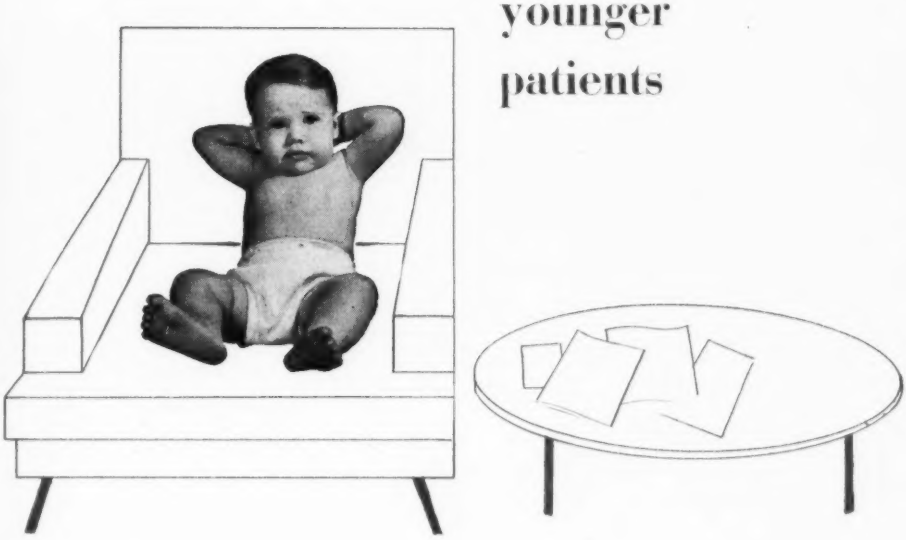
In renal colic, DEPROPANEX *alleviates both pain and spasm: "Relaxation of this spasm causes relief from pain and also restores the physiological normalcy in the ureter."*[3]

DEPROPANEX Deproteinated Pancreatic Extract is supplied in 10-cc. rubber-capped vials.

Sharp & Dohme, Philadelphia 1, Pa.

1. Heimark, J.J. and Parsons, R.L.: Minnesota Med., *33*:1102, 1950.
2. J.A.M.A., Queries and Minor Notes, *135*:810, 1947.
3. Carroll, G. and Zingale, F.G.: Southern Med. J., *31*:233 1938.

New for your younger patients



CRYSTALLINE
Terramycin
BRAND OF OXYTETRACYCLINE AMPHOTERIC

FOR WELL-TOLERATED, PROMPTLY EFFECTIVE BROAD-SPECTRUM THERAPY

PEDIATRIC DROPS

1.0 GRAM

new economy in drop dosage treatment
Each bottle of Terramycin Pediatric Drops supplies 1.0 gram of Terramycin, often a sufficient total dose for therapy of many common illnesses.

delicious raspberry flavor
The same good taste which makes Terramycin Oral Suspension a favorite for older children and adults on broad-spectrum therapy.

new flexibility in infant dosage schedules
Nonalcoholic Terramycin Pediatric Drops supplies 100 mg. of pure crystalline Terramycin amphoteric in each cc. to meet most infant dosage requirements; may be diluted as required.

SUPPLIED:
10 cc. bottles containing 1.0 Gm. crystalline Terramycin amphoteric in raspberry-flavored, nonalcoholic vehicle with specially calibrated dropper.

Pfizer

world's largest producer of antibiotics

Antibiotic Division, CHAS. PFIZER & CO., INC., Brooklyn 6, N. Y.

Continued from page 632

Doctor's Hospital, Miami, observed its fourth year of operation recently with the addition of a third floor, which cost approximately $426,000 and equipment $35,000, bringing the total number of beds to 160.

GEORGIA

Dr. G. Lombard Kelly, Augusta, who has been connected with the Medical College of Georgia since 1918, being Dean of the College until he was elected president, has announced his retirement as president. He is succeeded by Dr. Edgar R. Pund, professor and director of pathology at the College since 1923.

Georgia Society of Ophthalmology and Otolaryngology has elected Dr. Stacy C. Howell, Atlanta, president; Dr. W. Eugene Mathews, Augusta, vice-president; and Dr. Alton V. Hallum, Atlanta, secretary-treasurer.

Dr. R. P. Parnell, recently released from military duty, is associated with Dr. J. C. Tanner in the Oakdale Community.

Dr. H. A. Thornton, formerly of Greensboro, is associated with Dr. Ed Cunningham and Dr. R. P. Shinall, Decatur, in the practice of medicine.

Dr. Lawson C. Johnson, Manchester, has been appointed local surgeon for the Atlantic Coast Line Railroad.

Dr. Marvin Monroe Head, Zebulon, was honored in an editorial in the *Pike County Journal* for his fifty-one years of service as a "country doctor" in Pike County.

Dr. Virginia Hamilton Maley, Hall County, was recently named "Woman of the Year" by the Gainesville Rotary Club.

Dr. C. B. Greer, Brunswick, was recently honored when the name of the elementary school was changed to the C. B. Greer school.

Dr. Alfred Colquitt, Jr., Marietta, recently completed a postgraduate course in gynecology at the Harvard Medical School, Boston.

Southeastern Surgical Congress at its recent meeting held in Louisville, Kentucky, re-elected Dr. B. T. Beasley and Dr. A. H. Letton, both of Atlanta, secretary-director and treasurer respectively. The next meeting of the Congress will be held in Birmingham, Alabama.

Dr. E. E. Butler has been named "Man of the Year" by the Gainesville Men's Progressive Club.

Concrete plans have been announced for the early construction of the new Grady Hospital in Atlanta.

Dr. Braswell E. Collins recently moved his office from Waycross to Macon. His practice is limited to diseases of the eye, ear, nose and throat.

KENTUCKY

Dr. J. Duffy Hancock, Louisville, president-elect of the Kentucky State Medical Association, was named by the Southeastern Surgical Congress as its president-elect during the recent annual meeting of the Congress held in Louisville. He will assume the presidency at the 1954 meeting in Birmingham, Alabama, succeeding Dr. J. R. Young, Anderson, South Carolina, who was installed at the Louisville meeting.

Dr. W. O. Johnson, Louisville, has been elected president of the Central Association of Obstetricians and Gynecologists.

Four physicians who have served Union County for an average of fifty years, or a combined total of 200, were honored recently when there was a celebration by the community at Morganfield. The physicians are Drs. John W. Conway, Henry B. Allen, Herbert B. Stewart and Casey B. Graves.

Dr. F. Buerk Zimmerman has re-established an office in the Francis Building, Louisville, for the practice of ophthalmology and otolaryngology.

Dr. Cathryn C. Vaden, who for the past year has been with the Somerset Clinic, Somerset, has returned to Liberty to practice.

Dr. Edgar W. Northcutt, Covington, has returned from a six-weeks' tour of South American countries. While there he attended the meeting of the American College of Surgeons held in Buenos Aires.

Dr. Eddie F. Crocker recently entered the general practice of medicine at Haws Memorial Hospital, Fulton.

Dr. Herbert M. Bertram, Vanceburg, has opened an office in Portsmouth, Ohio, and will divide his practice between Vanceburg and Portsmouth.

Dr. Arch B. Clark has moved from McKee to Louisville where he is affiliated with the Children's Hospital.

Continued on page 44

THE NEW YORK POLYCLINIC

MEDICAL SCHOOL AND HOSPITAL

(Organized 1881)

(The Pioneer Post-Graduate Medical Institution in America)

COURSE FOR GENERAL PRACTITIONERS

Intensive full-time instruction covering those subjects which are of particular interest to the physician in general practice. Fundamentals of the various medical and surgical specialties designed as a practical review of established procedures and recent advances in medicine and surgery. Subjects related to general medicine are covered and the surgical departments participate in giving fundamental instructions in their specialties. Pathology and radiology are included. The class is expected to attend departmental and general conferences.

ANESTHESIA

A three months full-time course covering general and regional anesthesia, with special demonstrations in the clinics and on the cadaver of caudal, spinal, field blocks, etc.; instruction in intravenous anesthesia, oxygen therapy, resuscitation, aspiration bronchoscopy; attendance at departmental and general conferences.

SURGERY and ALLIED SUBJECTS

A combined surgical course comprising general surgery, traumatic surgery, abdominal surgery, gastroenterology, proctology, gynecological surgery, urological surgery. Attendance at lectures, witnessing operations, examination of patients preoperatively and postoperatively and follow-up in the wards postoperatively. Pathology, radiology, physical medicine, anesthesia. Cadever demonstrations in surgical anatomy, thoracic surgery, proctology, orthopedics. Operative surgery and operative gynecology on the cadaver; attendance at departmental and general conferences.

OBSTETRICS and GYNECOLOGY

A full time course. In Obstetrics: lectures; prenatal clinics; witnessing normal and operative deliveries; operative obstetrics (manikin). In Gynecology: lectures; touch clinics; witnessing operations; examination of patients preoperatively; follow-up in wards postoperatively. Obstetrical and gynecological pathology. Anesthesia. Attendance at conferences in obstetrics and gynecology. Operative gynecology on the cadaver.

For Information about these and other courses Address

THE DEAN, 345 WEST 50th STREET, NEW YORK 19, N. Y.

for the "squeeze" of g.i. spasm

antispasmodic action virtually without atropinism . . .

through the selective spasmolysis of homatropine methylbromide (one-thirtieth as toxic as atropine) . . . *plus* the sedation of phenobarbital.

Each yellow tablet of MESOPIN-PB® or teaspoonful of yellow elixir contains 2.5 mg. homatropine methylbromide and 15 mg. phenobarbital. Also available as MESOPIN Plain (without phenobarbital) in white tablets, green elixir, and powder.

®Trademark of Endo Products Inc.

MESOPIN-PB®

®Trademark (Homatropine Methylbromide and Phenobarbital)

Endo®

Samples? Just write to:

Endo Products Inc., Richmond Hill 18, New York

Fig. 1: "Roentgen examination . . . revealed the ulcer to be very much in evidence."

Fig. 2: In ten weeks "the ulcer niche was no longer in evidence roentgenologically or gastroscopically."

Clinical Evaluation of Pro-Banthine*

CASE REPORT

"M. D., female, aged 48, had a posterior gastrojejunostomy 14 years ago for duodenal ulcer. The patient was fairly well until nine months ago when severe, intractable pains occurred. She was hospitalized and a subtotal gastrectomy was done.

"She remained well for only a few months and was referred to us because of recurrence of very severe pain and marked weight loss. Roentgen study revealed a fairly large ulcer niche on the gastric side of the anastomosis.

"The patient had been on various types of antacids and sedatives without relief from pain. She was given 60 mg. of Pro-Banthine q.i.d. and within 72 hours was able to sleep through the night for the first time in weeks.

"At the end of two weeks of such treatment the patient had absolutely no pain and felt that she had been 'cured.' Roentgen examination at this time revealed the ulcer to be very much in evidence (*Fig. 1*). Much persuasion was necessary to make the patient realize the importance of maintaining her diet and therapy.

"Ten weeks of controlled regulation was necessary before we were satisfied that the ulcer niche was no longer in evidence roentgenologically or gastroscopically (*Fig. 2*).

"She has been maintained on 30 mg. [q. i. d.] of Pro-Banthine for almost five months with no recurrence of symptoms."

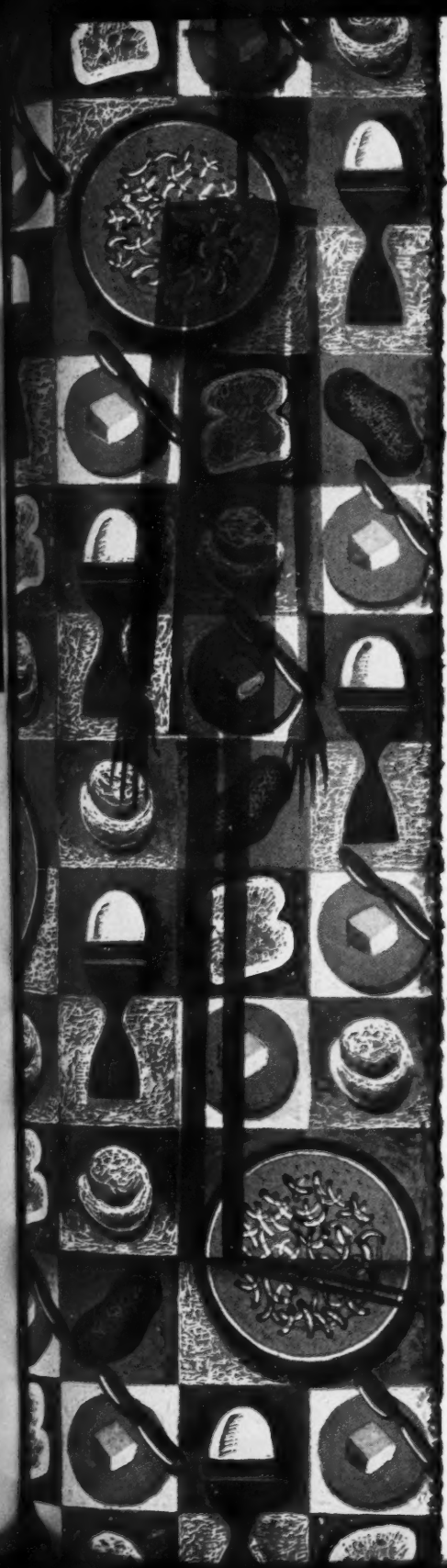
Schwartz, I. R.; Lehman, E.; Ostrove, R., and Seibel, J. M.: A Clinical Evaluation of a New Anticholinergic Drug, Pro-Banthine, to be published.

Pro-Banthine (*brand of propantheline bromide*), the new, improved anticholinergic agent, is more potent and, consequently, a smaller dosage is required and side effects are greatly reduced or absent.

Peptic ulcer, gastritis, intestinal hypermotility, pancreatitis, genitourinary spasm and hyperhidrosis respond effectively to Pro-Banthine, orally, combined with dietary regulation and mental relaxation.

*Trademark of G. D. Searle & Co.

SEARLE *Research in the Service of Medicine*



for caloric boost
without gastric burden
...when weight gain
is the objective

EDIOL

TRADEMARK

[ORAL FAT EMULSION SCHENLEY]

Just 2 tablespoonfuls of EDIOL* oral fat emulsion q.i.d. add 600 extra calories to the daily diet without increasing bulk intake or blunting the appetite for essential foods. This EDIOL regimen is the caloric equivalent of:

6 servings of macaroni and cheese, or
1 dozen Parker House rolls, or
12 pats of butter, or
8 boiled eggs, or
6 baked potatoes, or
9½ slices of bread

EDIOL is an exceptionally palatable, creamy emulsion of vegetable oil (50%) and sucrose (12½%). The unusually fine particle size of EDIOL (average, 1 micron) favors ease of digestion, rapid assimilation. For children, or when fat tolerance is a problem, small initial dosage may be prescribed, then increased to the level of individual tolerance.

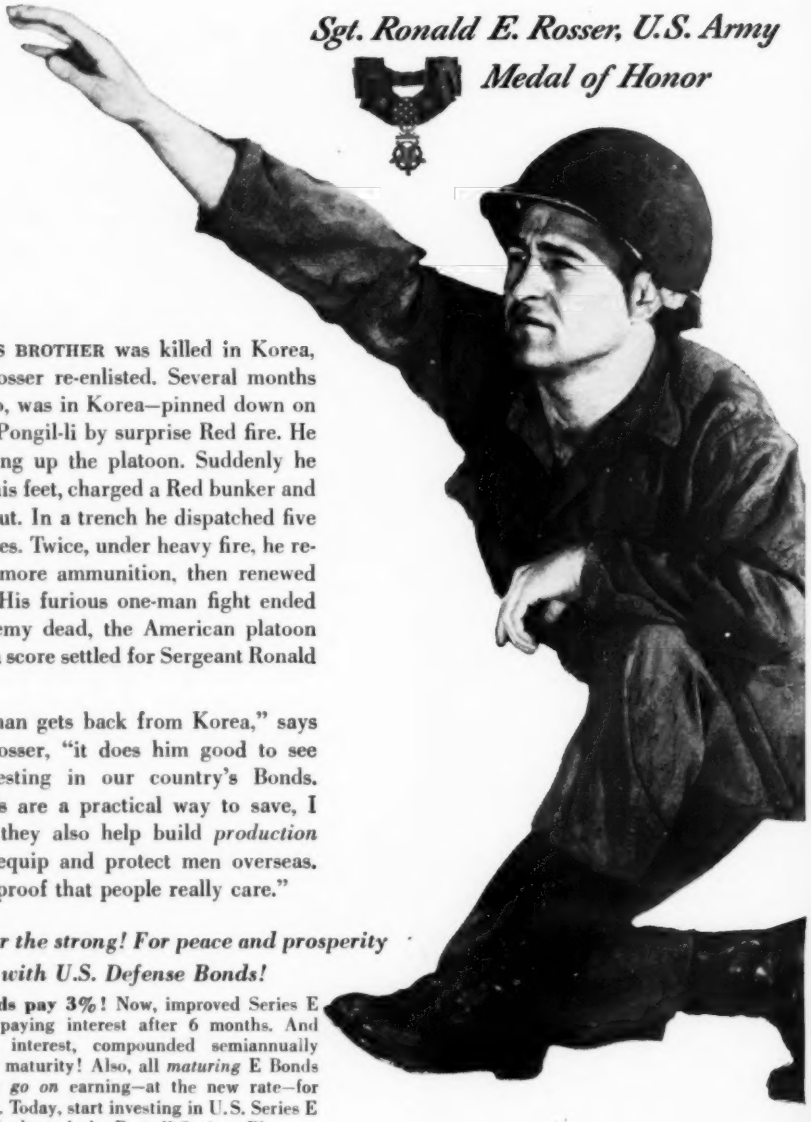
Available through all pharmacies, in bottles of 16 fl.oz.

schenley

SCHENLEY LABORATORIES, INC.

LAWRENCEBURG, INDIANA

A Score Settled . . .



Sgt. Ronald E. Rosser, U.S. Army
Medal of Honor

WHEN HIS BROTHER was killed in Korea, Sergeant Rosser re-enlisted. Several months later he, too, was in Korea—pinned down on a hill near Pongil-li by surprise Red fire. He saw it cutting up the platoon. Suddenly he jumped to his feet, charged a Red bunker and cleaned it out. In a trench he dispatched five more enemies. Twice, under heavy fire, he returned for more ammunition, then renewed his attack. His furious one-man fight ended with 13 enemy dead, the American platoon saved, and a score settled for Sergeant Ronald Rosser.

"When a man gets back from Korea," says Sergeant Rosser, "it does him good to see people investing in our country's Bonds. Sure, Bonds are a practical way to save, I know. But they also help build *production power*—to equip and protect men overseas. And that's proof that people really care."

Peace is for the strong! For peace and prosperity save with U.S. Defense Bonds!

Now E Bonds pay 3%! Now, improved Series E Bonds start paying interest after 6 months. And average 3% interest, compounded semiannually when held to maturity! Also, all *maturing* E Bonds automatically *go on* earning—at the new rate—for 10 *more* years. Today, start investing in U.S. Series E Defense Bonds through the Payroll Savings Plan.

The U. S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

especially for the carriage trade...

Children like Vi-Penta Drops because they taste good. Mothers like them because they are easy to give in milk, fruit juice, formula or dropped directly on the tongue. Doctors like them because they provide required amounts of vitamins A, C, D, and important B-complex factors, and because they're dated to insure full potency. Vi-Penta® Drops 'Roche' in packages of 15, 30 and 60 cc with calibrated dropper.

BALANCED....

BICILLIN-SULFAS gives you a balanced formula of BICILLIN (the new penicillin) and SULFOSE® (triple sulfonamides, Wyeth). This judicious equilibrium produces optimal blood levels of the two agents... prevents penicillin and sulfonamide resistant strains of organisms.

BICILLIN-SULFAS' broad antibacterial spectrum, its proved synergistic and additive actions, its prolonged action (due to the slow release of the active agents by the special alumina base) make it a preferred prescription in an unusually wide range of common infections.

Suspension—bottles of 3 fl. oz.; Tablets—bottles of 36. Each teaspoonful (5 cc.) and each tablet contains 150,000 units BICILLIN and 0.5 Gm. triple sulfonamides. Complete information to physicians on request.

BICILLIN®-SULFAS

Benzethacil and Triple Sulfonamides, Wyeth

Wyeth®

Philadelphia 2, Pa.

specify Abbott's *new oral antibiotic*

ERYTHROCIN

TRADE MARK

(ERYTHROMYCIN, ABBOTT)

E*specially effective against gram-positive organisms resistant to other antibiotics.*

L*ow toxicity; reported side effects infrequent.*

S*pecial "high-blood-level" coating.*
Erythrocin, 0.1-Gm. (100-mg.) Tablets, bottle of 25.

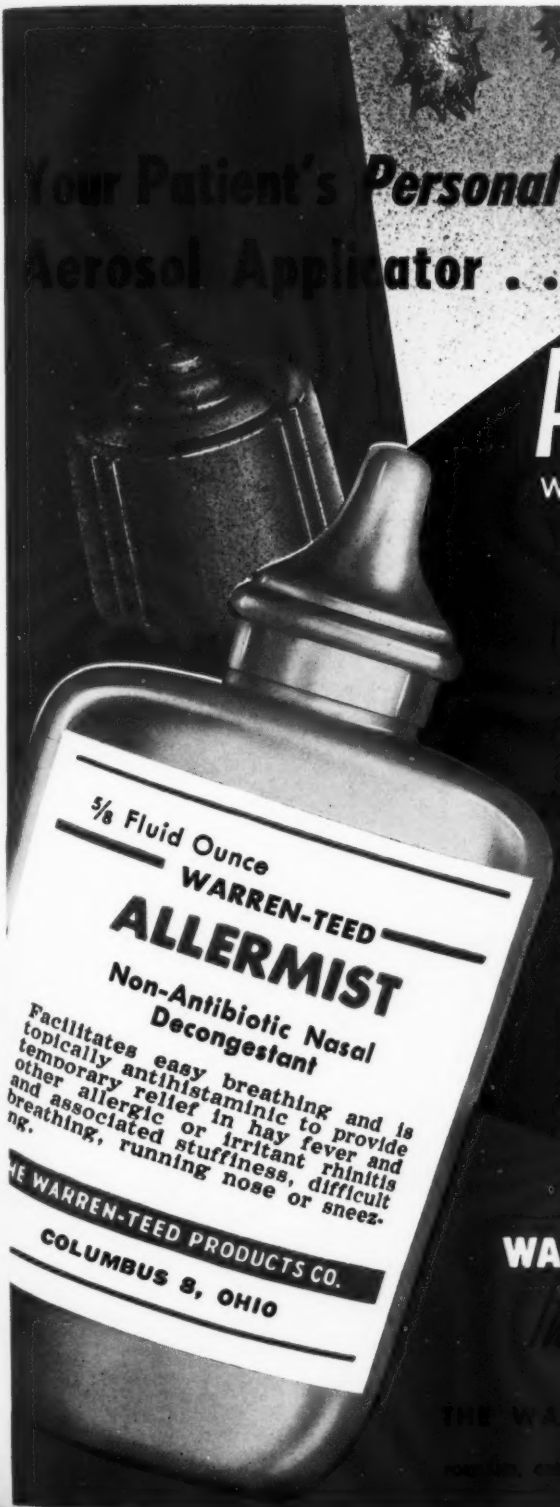
INDICATIONS: Pharyngitis, tonsillitis, scarlet fever, erysipelas, pneumococcic pneumonia, osteomyelitis, pyoderma. *Also other infections caused by organisms* susceptible to its action, which include staphylococci, streptococci and pneumococci.

DOSAGE: Total daily dose of 0.8 to 2 Gm., depending on severity of the infection. A total daily dose of 0.6 Gm. is often adequate in the treatment of pneumococcic pneumonia. *For the average adult* the initial dose is 0.2 Gm. to be followed by doses of 0.1 or 0.2 Gm. every four to six hours. *For severely ill patients* doses up to 0.5 Gm. may be repeated at six-hour intervals if necessary. Satisfactory clinical response should appear in 24 to 48 hours if the causative organism is susceptible to ERYTHROCIN. Continue for 48 hours after temperature returns to normal. Abbott

1. McGuire et al. (1952), J. Antibiotics & Chemo., 2:281, June.
2. Heilman et al. (1952), Proc. Staff Meet. Mayo Clin., 27:385, July 16.
3. Haight and Finland (1952), New Eng. J. Med., 247:227, Aug. 14.

1-139A

Your Patient's Personal Aerosol Applicator . . .


5/8 Fluid Ounce
WARREN-TEED
ALLERMIST
Non-Antibiotic Nasal Decongestant
Facilitates easy breathing and is topically antihistaminic to provide temporary relief in hay fever and other allergic or irritant rhinitis and associated stuffiness, difficult breathing, running nose or sneezing.
THE WARREN-TEED PRODUCTS CO.
COLUMBUS 8, OHIO

ALLERMIST

WARREN—TEED

Anti-Allergenic Nasal Decongestant
to Relieve Symptoms of

HAY FEVER • BEGINNING COLDS
ALLERGIC or IRRITANT RHINITIS

Always Ready easily carried in purse or pocket.

Most Convenient simple, inconspicuous to use.

More Effective penetrating aerosol mist is rapidly and widely dispersed throughout the nasal tract.

Each 5/8 fluid ounce of ALLERMIST contains:

Vasoconstrictor phenylephrine hydrochloride	0.25%
Antihistamine thenylpyramine hydrochloride	0.20%
Antiseptic and Wetting Agent methylbenzethonium chloride (Warren-Teed Hyseptine)	0.01%

WARREN-TEED
Pharmaceuticals

THE WARREN-TEED PRODUCTS CO.
COLUMBUS 8, OHIO

A FRANK STATEMENT . . . ABOUT *VITA-FOOD*

The benefits of brewers' yeast are not subject to dispute. Its use both in human and animal nutrition is a matter of record. It is generally recognized as the richest natural source of the *entire* vitamin B complex, of nutritionally *complete* protein and *naturally* occurring minerals.

But before you prescribe, bear in mind that all yeasts are *not* brewers' yeast, nor do all brewers' yeasts measure up to the higher *quality* and balanced *potency* of VITA-FOOD. It differs not only in its superior culture media but also in the skill and know how involved in its production.

The essential value of VITA-FOOD has been proved for more than a quarter of a century of continuous use by physicians, hospitals, health departments and research laboratories. Its use for protection and relief of pellagra is only one of its greater achievements.

COMPARE THIS VITAMIN B ASSAY

Per Ounce (Two heaping tablespoonfuls)

Thiamin	4.2 mg.
Riboflavin	1.4 mg.
Niacin	11.3 mg.
Pantothenic Acid	3.4 mg.
Choline	119.0 mg.
Inositol	113.4 mg.
Pyridoxine	800 mcg.
Folic Acid	110 mcg.
Biotin	30 mcg.
Para-Amino-Benzoic Acid	280 mcg.

Plus independent vitamin B growth, lactation and other vitamin B factors natural to genuine Brewers' Yeast.

VITAMIN FOOD CO., INC.

187 SYLVAN AVE.

NEWARK 4, NEW JERSEY

Continued from page 36

LOUISIANA

Louisiana State University School of Medicine, New Orleans, has been awarded $9,558 by the Life Insurance Medical Research Fund of New York for research by Dr. Russell L. Holman on the pathogenesis of arterial lesions.

Tulane University School of Medicine, New Orleans, has been awarded $10,800 by the Life Insurance Medical Research Fund of New York for research by Dr. Emmanuel Farber on protein metabolism and degenerative changes in tissues.

MARYLAND

Dr. Robert E. Bauer, University of Maryland School of Medicine, Department of Medicine, Baltimore, has been awarded a clinical grant by Sharp & Dohme, Philadelphia, Pennsylvania, in the amount of $1,800 for the support of studies in intestinal antisepsis.

Dr. C. E. Waller, Baltimore, has retired as chief of the Maryland State Department of Health's division of Venereal Disease Control and is succeeded by Dr. John C. Hume, assistant director of the Johns Hopkins School of Hygiene and Public Health and associate professor of public health administration at the school.

Baltimore City Medical Society at its annual meeting elected Dr. Wetherbee Fort, president; Dr. Lewis P. Gundry, vice-president; Dr. Edward F. Cotter, secretary; and Dr. Robert C. Kimberly, treasurer.

MISSISSIPPI

Dr. John F. Lucas, Greenwood, has been appointed a member of the Council of the Southern Medical Association from Mississippi for a regular Council term of five years, beginning at the close of the annual meeting in Atlanta, Georgia, in late October, the appointment having been announced recently by the president-elect, Dr. Alphonse McMahon, St. Louis, Missouri. Dr. Lucas succeeds Dr. Lamar Arrington, Meridian, whose term will expire with the close of the Atlanta meeting and who having served the constitutional limit is not eligible for reappointment.

The Mississippi State Medical Association held its Eighty-Fifth Annual Session at Biloxi, May 11-14. Dr. M. Q. Ewing, Amory, was installed president; Dr. C. H. McCall, Gulfport, was elected president-elect; Dr. J. P. Culpepper was re-elected delegate to the American Medical Association for a two-year term and Dr. J. F. Lucas, Greenwood, was elected for a one-year term. Dr. Lamar Arrington, Meridian, was the retiring president. The meeting next year will be held in Jackson.

Washington County Hospital, Greenville, was recently opened and dedicated. It is a four-story building with one hundred beds for white and one hundred for colored, with more than fifty doctors in the city on the staff. Dr. Hugh A. Gamble is Chief of Staff.

Dr. Harvey F. Garrison, Dr. Harvey F. Garrison, Jr., Dr. Byron Alexander announce the association of Dr. Howard H.

Continued on page 48

Classified Advertisements

WANTED—For October 1, Physician for Alabama State Mental Institution. Salary $6,000.00 to $7,800.00. Must be Licensed. Write Dr. J. S. Tarwater, Superintendent The Bryce Hospital, Tuscaloosa, Alabama.

FOR SALE—Government Surplus, Hospital, X-Ray and Medical Equipment. Very Reasonable. A. H. Smullian & Company, P. O. Box 4867, Atlanta, Georgia.

RESIDENT PHYSICIAN AND SURGEON—Immediate opening at Maryland State Penal Institution located near Baltimore City. Must be graduate of a Class A Medical School; must have completed an internship in surgery by the AMA; plus suitable experience in general surgery in hospitals approved by the AMA. A Maryland license to practice medicine will be required. Salary: $8520. Contact Office of the Maryland State Employment Commissioner, 31 Light Street, Baltimore 2, Maryland for complete information.

FOR SALE—Complete used office equipment, instruments, furniture, etc. All in good condition. Terms reasonable. Contact MS, c/o SMJ.

IN ANY ALLERGY

'Co-Pyronil' *

affords

more profound,

more prolonged

relief with

fewer side-effects

than any other

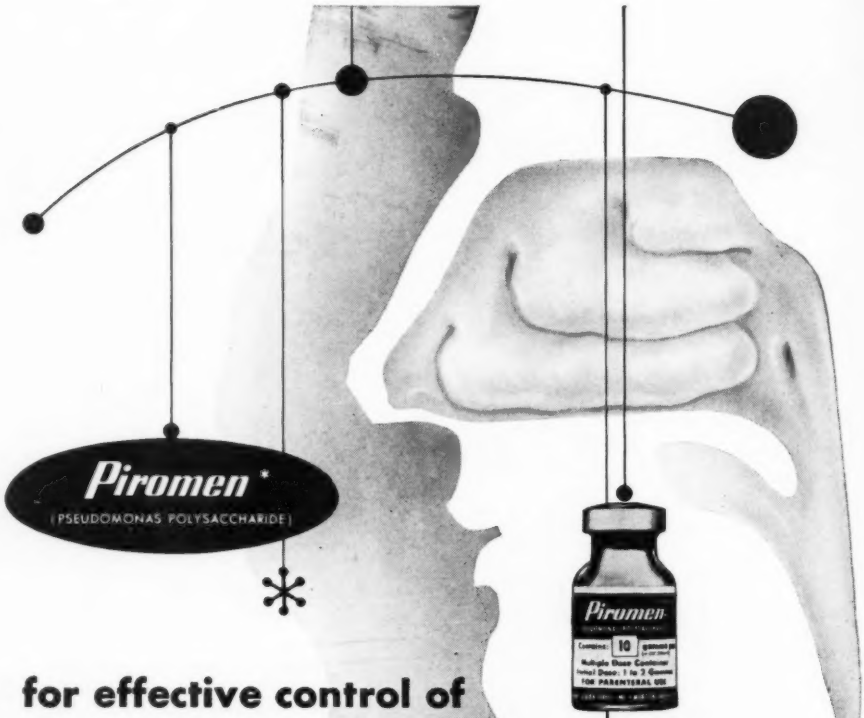
known

antihistaminic.

*'Co-Pyronil' (Pyrrobutamine Compound, Lilly)

Dosage
Mild symptoms: 1 pulvule every twelve hours.
Moderate symptoms: 1 pulvule every eight hours.
Severe symptoms: 2 pulvules every eight hours.

Lilly



for effective control of

HAY FEVER,

other ALLERGIES and DERMATOSES

In the case of hay fever, **Piromen** alleviates the immediate symptoms of pollenosis, and maintains effective control. Even cases which have shown little improvement to desensitization and antihistaminics usually respond to the administration of **Piromen**.

***Piromen** has also demonstrated its efficacy, reliability, and safety in the treatment of many other allergies and dermatoses.*

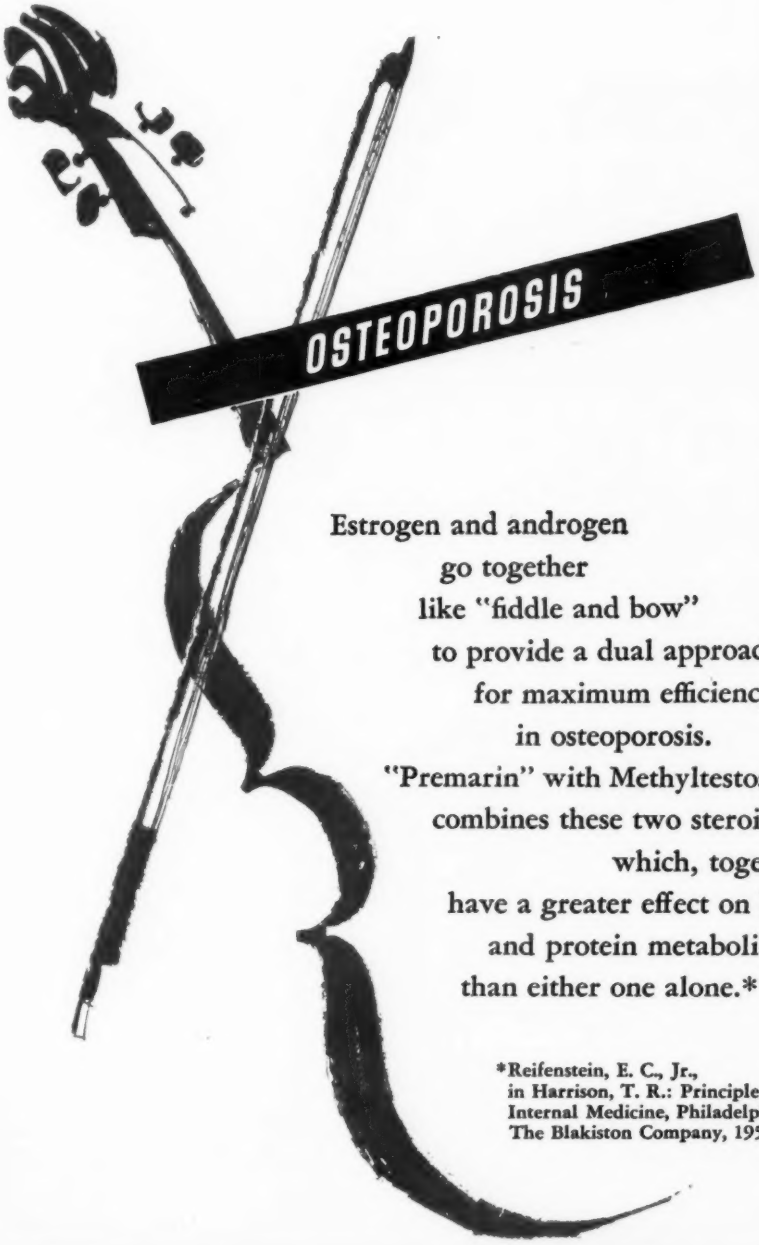
***Piromen** is supplied in 10 cc. vials containing either 4 gamma (micrograms) per cc., or 10 gamma per cc.*

for additional information, merely write "Piromen" on your** Rx **and mail to—

TRAVENOL LABORATORIES, INC.

*tradename

Subsidiary of BAXTER LABORATORIES, INC., MORTON GROVE, ILLINOIS



OSTEOPOROSIS

Estrogen and androgen
go together
like "fiddle and bow"
to provide a dual approach
for maximum efficiency
in osteoporosis.
"Premarin" with Methyltestosterone
combines these two steroids
which, together,
have a greater effect on bone
and protein metabolism
than either one alone.*

*Reifenstein, E. C., Jr.,
in Harrison, T. R.: Principles of
Internal Medicine, Philadelphia,
The Blakiston Company, 1950, p. 655.

"PREMARIN"® with METHYLTESTOSTERONE

for combined estrogen-androgen therapy

5316

Ayerst, McKenna & Harrison Limited • New York, N. Y. • Montreal, Canada

Continued from page 44

Nuchols in the practice of pediatrics at the Children's Clinic, Jackson.

Dr. Roland E. Toms, psychiatrist in chief at the Earle Johnson Sanatorium, Meridian, has opened an office at the Sanatorium for examination and treatment of private patients, practice limited to psychiatry and neurology.

MISSOURI

St. Louis University School of Medicine, St. Louis, has been awarded $14,040 by the Life Insurance Medical Research Fund of New York for research by Dr. C. Rollins Hanlon on respiratory and hemodynamic changes after experimental pulmonary vascular obstruction.

Dr. Alrick B. Hertzman, professor of physiology and director of the department, St. Louis University School of Medicine, St. Louis, went to London in May to deliver a paper on "The Problem of Vasomotor Denervation" before a Symposium on "The Peripheral Circulation in Man," sponsored by the Ciba Foundation for the Promotion of International Cooperation in Medical and Chemical Research.

Dr. Thomas Dobbins, Hillsboro, who established the Health Unit in Jefferson County in 1950, has resigned and will take an extended vacation.

Dr. S. Richard Silverman, St. Louis, recently spoke before the Fifth National Congress for OALR at Amsterdam, The Netherlands.

Dr. Lawrence T. Post, St. Louis, retiring professor of clinical ophthalmology, Washington University School of Medicine, was honored by the University recently at a testimonial dinner.

Dr. William A. Sodeman, chairman of the Department of Tropical Medicine and Public Health, Tulane University, New Orleans, will become chairman of the Department of Medicine, University of Missouri School of Medicine on July 1.

Continued on page 50

Aminophyllin . . .

a "most effective single agent for prompt relief" of severe **bronchial asthma**

"useful as a peripheral vasodilator and myocardial stimulant" in

pulmonary edema
paroxysmal dyspnea of congestive heart failure
Cheyne-Stokes respiration

H. E. DUBIN LABORATORIES, INC.
250 E. 43rd St. • New York 17, N. Y.

dubin
aminophyllin
(theophylline-ethylenediamine)

readily soluble for rapid therapeutic effect.

TABLETS • AMPULS
POWDER
SUPPOSITORIES

BURO-SOL
"DOAK"
POWDER

READILY SOLUBLE IN WATER

* Buro-Sol solution is therapeutically equal to Burow's solution. (Liq. Alum. Acet.)
* A teaspoonful of Buro-Sol Powder to a pint of water is therapeutically equal to 1:15 Burow's solution.
* Applied on acutely inflamed surfaces, weeping eczema, the inflammatory process will be mitigated.

Please write for samples.

DOAK PHARMACAL CO., INC.
11 West 42nd Street
NEW YORK 36, N. Y.

FOR SALE...

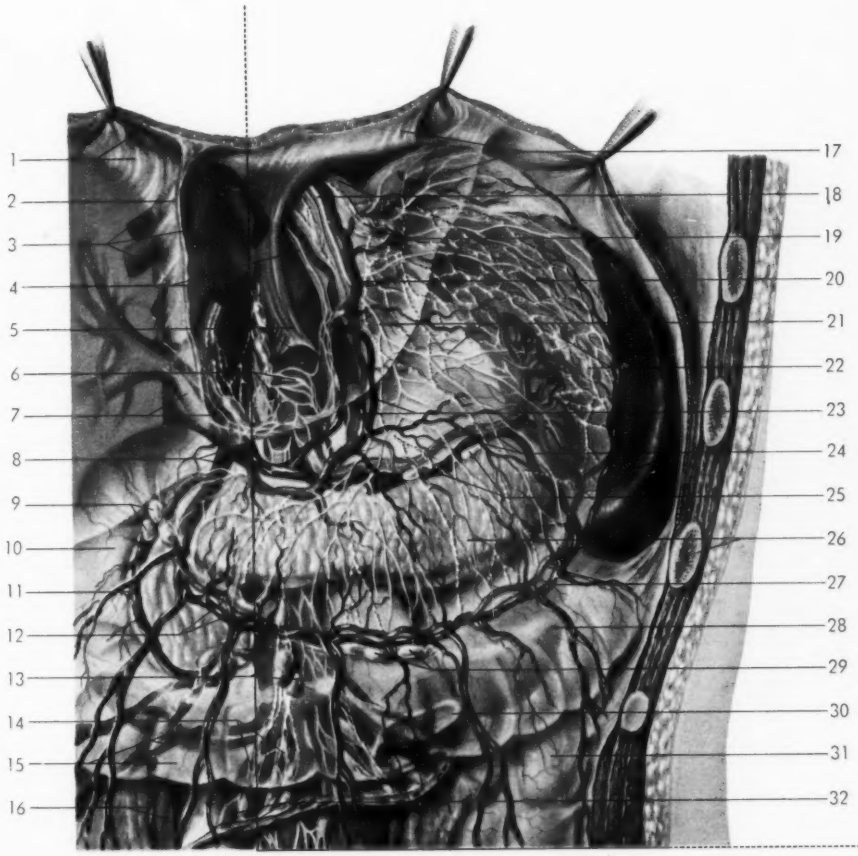
PROFITABLE
ESTABLISHED SANITARIUM

Death of physician-owner puts on market completely equipped Brookhaven Manor Sanitarium, 16 miles from Atlanta, 42 beds plus 2 dormitories. 10 year staff still available.

Three acres of land beautifully landscaped; two brick buildings in good condition. Available at once, $80,000, reasonable cash payment, 15-year terms. Wire or phone . . .

Henry Robinson,
ADAMS-CATES CO., Realtors
Phone WAlnut 5477 201 Hurt Bldg.
Atlanta, Ga.

Upper Left Quadrant of the Abdomen



1 Diaphragm and coronary ligament
2 Falciform ligament
3 Hepatic veins
4 Inferior vena cava and right vagus nerve
5 Crus of diaphragm and abdominal aorta
6 Celiac artery and celiac plexus
7 Hepatic artery and portal vein
8 Gastroduodenal artery and vein
9 Subpyloric lymph nodes
10 Duodenum
11 Superior pancreaticoduodenal artery and vein
12 Right gastroepiploic artery and vein
13 Superior mesenteric artery and vein
14 Superior mesenteric lymph nodes
15 Transverse colon and right colic artery and vein
16 Spermatic artery and vein
17 Left triangular ligament and left lobe of liver
18 Esophagus and left vagus nerve
19 Paracardial lymph nodes
20 Esophageal branch of left gastric artery and vein
21 Gastric rami of vagus nerve
22 Splenic lymph nodes
23 Left gastric artery and coronary vein
24 Spleen and splenic artery and vein
25 Superior pancreatic lymph nodes
26 Pancreas and tenth rib
27 Left gastroepiploic artery and vein
28 Left kidney
29 Inferior gastric lymph nodes
30 Jejunum
31 Descending colon
32 Ileocolic artery and vein

This is one of a series of paintings for Lederle by Paul Peck, illustrating the anatomy of various organs and tissues of the body which are frequently attacked by infection, where aureomycin may prove useful.

Lederle

In peritonitis,
in intestinal infections,
and as a prophylactic adjunct
in surgery of the bowel—

Aureomycin

HYDROCHLORIDE CRYSTALLINE

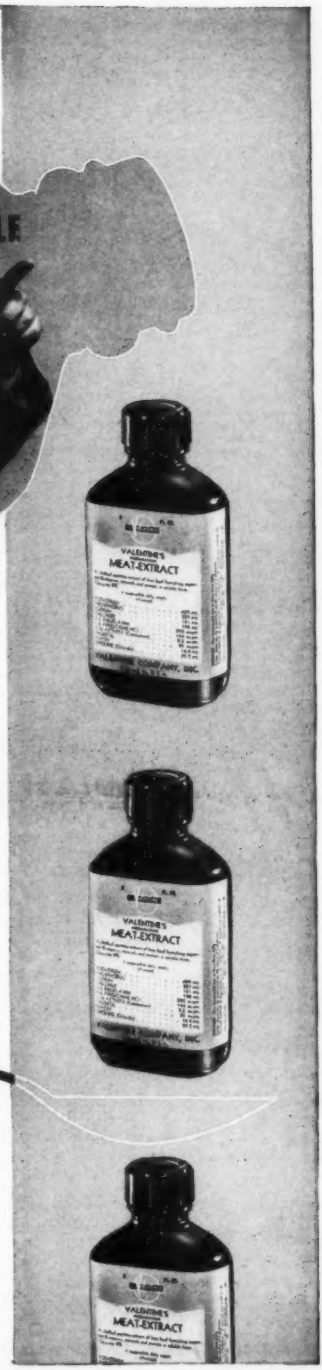
provides an unsurpassed
range of antimicrobial action

Literature available on request

LEDERLE LABORATORIES DIVISION
AMERICAN Cyanamid COMPANY
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

OLD AGE BENEFITS

IN EVERY BOTTLE



VALENTINE'S MEAT EXTRACT

HAS SPECIAL VALUE FOR THE AGED AND AGING, PROVIDING:

the psychologic benefits of a "tonic", plus the physiologic benefits derived from

- **stimulation of failing appetites**
- **increased flow of digestive fluids**
- **supplementary amounts of vitamins, minerals and soluble proteins**
- **extra-dietary vitamin B_{12}**
- **protective quantities of potassium in a palatable and readily assimilated form**

Supplied in bottles of 2 and 6 fluidounces.
DOSAGE: One teaspoonful two or three times daily. Two or three times this amount may be prescribed for potassium therapy.

VALENTINE COMPANY, INC.

RICHMOND 9, VIRGINIA

Continued from page 48

Dr. Kenneth Glover, Mount Vernon, has been appointed county physician by the county court of Lawrence County.

Dr. Durward G. Hall, Springfield, recently attended the Inter-America Session of the American College of Surgeons at Sao Paulo. While in Brazil he also spent some time in Rio de Janeiro.

Dr. John H. Platz, a staff member of Atwood Hospital, Carrollton, recently purchased the hospital.

Dr. Ralph V. Byrne, formerly of St. Joseph, is associate clinical professor of surgery, University of Southern California School of Medicine, Los Angeles, and is new president of the Los Angeles Surgical Society.

Mrs. Edward H. Skinner, Kansas City, recently received the Gold Medal of the American College of Radiology on behalf of the late Dr. Edward H. Skinner. Dr. Skinner was the ninth Gold Medalist in a thirty year period. The medal is inscribed "To Edward H. Skinner, M.D., C.A.C.R., for distinguished and extraordinary service to the American College of Radiology and to the profession for which it stands. Presented by the Board of Chancellors, 1953."

NORTH CAROLINA

Duke University School of Medicine, Durham, has been awarded by the Life Insurance Medical Research Fund of New York $13,500 for research by Dr. Philip Handler on humoral interrelationships in renal hypertension; and $10,800 for research by Dr. Wilfried F. H. M. Mommaerts on chemical and molecular phenomena in cardiac activity.

Dr. Joseph H. Perlmutt, formerly associate in surgical research, University of Pennsylvania School of Medicine, Philadelphia, has joined the staff of the Department of Physiology, University of North Carolina School of Medicine, Chapel Hill, as assistant professor.

Dr. James E. Hemphill and the Hemphill Radiology Clinic, Charlotte, have announced the association of Dr. John F. Sherrill.

Tri-State Medical Association of the Carolinas and Virginia, at its fifty-fourth annual meeting held in Durham recently installed Dr. James Asa Shield, Richmond, Virginia, president; and elected Dr. G. C. Dixon, Ayden, South Carolina, president-elect and program chairman; and Dr. R. B. Davis, Greensboro, secretary-treasurer.

A newly organized Orthopedic Club held its first annual meeting at Duke Hospital, Durham, in April. Dr. Lenox D. Baker, Durham, is coordinator of the organization, in which surgeons are trained at Duke, Warm Springs, Gastonia, Charlotte, or Greenville, South Carolina.

Dr. George D. Penick, instructor in pathology, University of North Carolina School of Medicine, has been selected as a Markle Scholar in Medical Science for 1953. The John and Mary R. Markle Foundation awarded $30,000 to the University to assist in furthering Dr. Penick's education and research, this amount to be granted in annual installments of $6,000. The Markle Foundation is awarding 21 such scholarships in the United States and Canada this year.

Dr. W. Howard Wilson, Raleigh, is associated with Dr. Newton G. Pritchett, practice limited to internal medicine.

The Association of Southeastern Biologists held its fourteenth annual meeting at the University of North Carolina, Chapel Hill, in April. New officers are: Dr. Bruce D. Reynolds, Miller School of Biology, University of Virginia, Charlottesville, president; Dr. H. E. Totten, Department of Botany, University of North Carolina, president-elect; Dr. Alvin Beatty, Emory University School of Medicine, Atlanta, Georgia, vice-president; Dr. J. Paul Reynolds, Florida State University, Tallahassee, treasurer; and Dr. Mary Esther Gaulden, Oak Ridge National Laboratory, continues as secretary. The 1954 meeting will be held on the campus of Louisiana State University, Baton Rouge.

OKLAHOMA

Dr. Henry H. Turner, Oklahoma City, has been appointed a member of the Council of the Southern Medical Association

Continued on page 54

THIS ALL-PURPOSE DIATHERMY IS ECONOMICAL

THE Burdick UNIVERSAL MF-49 DIATHERMY

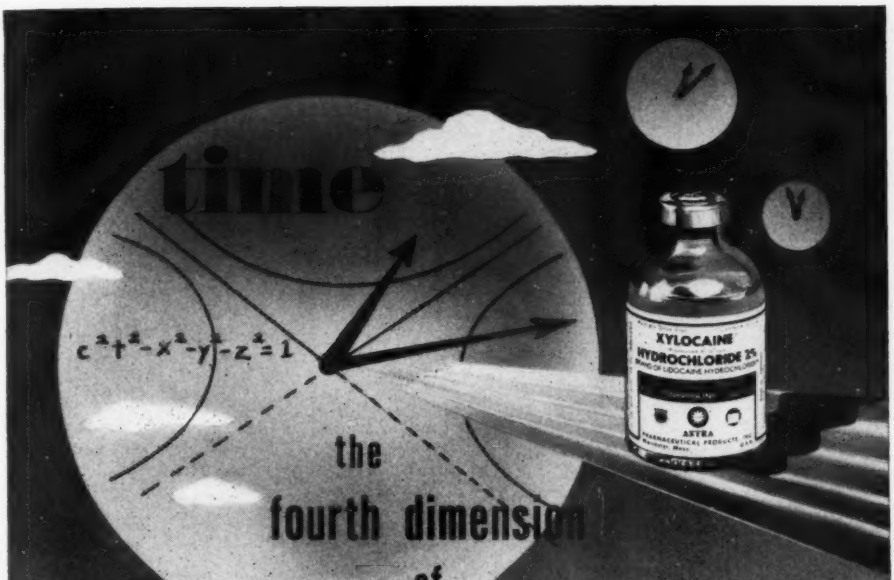
● Adaptable to ALL technics—contour applicator (illustrated), induction cable, air-spaced electrodes and cuff technic. A smooth current is provided for minor electrosurgery.

Power for Deep Heating — frequency is controlled by a unique method which permits the full power tube output for heating of both large and small areas by short wave diathermy.

Accepted by A.M.A. Council on Physical Medicine and Rehabilitation; *approved by F.C.C.* and the Underwriters Laboratories. Economical — as illustrated, with contour applicator, $642.00 f.o.b. factory.

F.C.C. Approval D 507

THE BURDICK CORPORATION MILTON, WISCONSIN



the
fourth dimension
of
PREFERRED local anesthesia

Xylocaine® Hydrochloride (Astra) merits special consideration by the busy anesthesiologist and surgeon. Profound in depth and extensive in spread, its well-tolerated effect is more significantly measured by the time saved through its remarkably fast action, by which so much normally wasted "waiting time" is converted to productive "working time".

Stocked by leading wholesale druggists and surgical supply houses as a ½%, 1% or 2% solution without Epinephrine and with Epinephrine 1:100,000. 2% solution is also supplied with Epinephrine 1:50,000. All solutions dispensed in 50cc. and 20cc. multiple dose vials, packed 5x50cc. or 5x20cc. to a carton.

XYLOCAINE® HCL

Pronounced Zī lo'cain

(Brand of lidocaine *HCL)

AN AQUEOUS SOLUTION

A 4th dimensional approach to preferred local anesthesia

Bibliography available on request

ASTRA PHARMACEUTICAL PRODUCTS, INC.
WORCESTER, MASS. U.S.A.

*U.S. Patent No. 2,441,498

CARROL TURNER SANATORIUM

MEMPHIS, TENNESSEE, ROUTE 10, BOX 288

For the Diagnosis and Treatment of Mental and Nervous Diseases

Located on the Raleigh-LeGrange Road, five miles east of the city limit —accessible to U. S. Highway 70 (Bristol Highway)

Situated on a sixty-six acre tract of wooded land and rolling fields, the environment is conducive to amelioration of the symptoms of emotionally disturbed patients

Modernly equipped with adequate facilities for physical and hydrotherapy, electroshock, and insulin therapy

Special emphasis is laid on recreational and occupational therapy

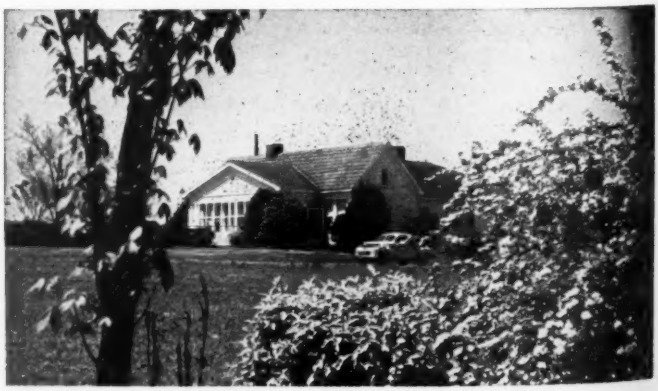
Adequate nursing personnel assures individual attention to each patient

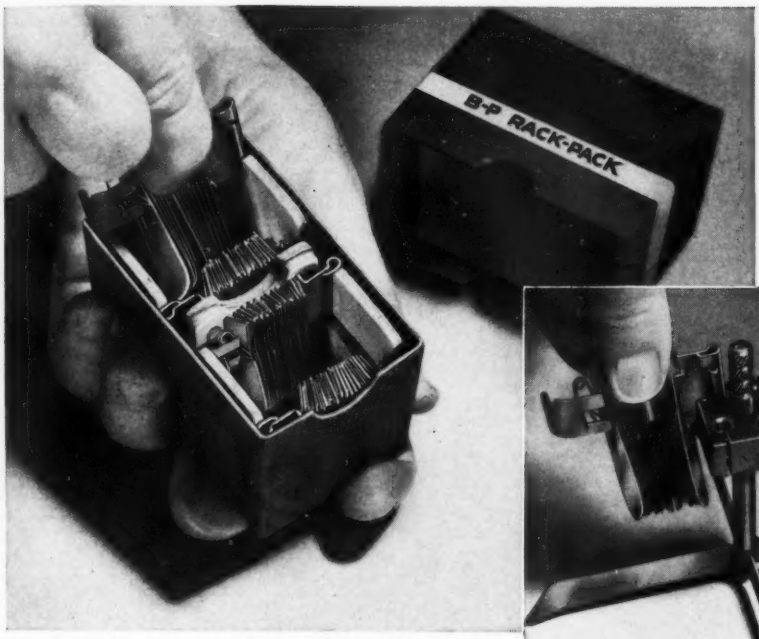
The main building and hospital department of the Sanatorium is shown above

FAIRFIELD

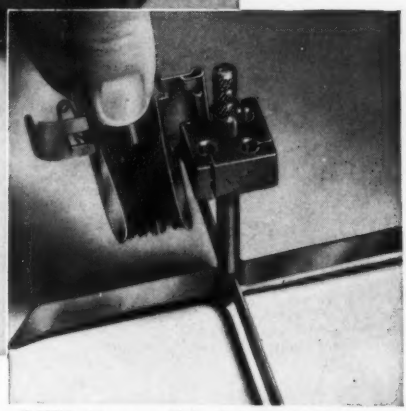
Our convalescent home is located on the Sanatorium Grounds

The home is especially designed and fitted for the care of elderly people.





Contains one gross of one size Blades on 4 Racks



RACKS with any size Blades fit the RACK-PACK Stand

A package is known by the COMPANY it keeps . . .

This **B-P RACK-PACK**

of RIB-BACK SURGICAL BLADES

is convincing proof! Just as you can depend upon RIB-BACK Blades to give you maximum cutting efficiency—you can rely on the RACK-PACK package to really save TIME and LABOR for your O.R. Personnel.

NO wrapping of individual packages
NO removing of individual blades
NO handling or racking of individual blades

The RACK-PACK fully protects the perfect cutting edges from damage in shipping, storing and pre-operative handling. V.P.I. rust inhibiting liner prevents corrosion. Blades already on RACK . . . ready for sterilization "*in a matter of seconds.*" AND —it costs the same as conventionally packaged Blades.

Ask your dealer to show you a B-P RACK-PACK today.

BARD-PARKER COMPANY, INC. • Danbury, Connecticut

Continued from page 50

from Oklahoma for a regular Council term of five years, beginning at the close of the annual meeting in Atlanta, Georgia, in late October, the appointment having been announced recently by the president-elect, Dr. Alphonse McMahon, St. Louis, Missouri. Dr. Turner succeeds Dr. Fred E. Woodson, Tulsa, whose term will expire with the close of the Atlanta meeting and who having served the constitutional limit is not eligible for reappointment.

SOUTH CAROLINA

Dr. W. P. Turner, who has practiced medicine in Greenwood for the past forty-three years, was recently the recipient of the Greenwood Rotary Club's Community Service Award.

Dr. James A. McLeod, recently released from military service, has returned to Florence for the practice of medicine.

Dr. Myron G. Howle, formerly of Summerton, is associated with Dr. E. Gaines Cannon, Pickens, in the practice of general medicine.

Dr. W. S. Fewell, Greenville, has retired from active practice and will devote full time to his post of Medical Director of the Liberty Life Insurance Company.

Dr. Barney F. Timmons has opened offices in Hartsville for the practice of ophthalmology and otorhinolaryngology.

Dr. Raymond C. Ramage, a native of Alabama, is associated with Dr. John K. Webb, Greenville, in the practice of surgery.

Dr. James Frampton, aged 80, was honored recently when the mayor of Mount Pleasant proclaimed "Frampton Day" the proclamation stressing the fact that Dr. Frampton had "served the area without regard to hardships and inconveniences." Dr. Frampton practiced medicine continuously there for 56 years.

Dr. Frederick E. Kredel, chief of surgery at the South Carolina Medical College, Charleston, has been named the outstanding contributor to the state's 1953 cancer program.

Dr. Leon Banov, Charleston County health officer, was the subject of a feature article in the March issue of *Health Officer's News Digest*.

Dr. W. Jervey Ravenel, Charleston, has been elected president of the Charleston Wildlife Federation.

TENNESSEE

Vanderbilt University School of Medicine, Nashville, has been awarded $8,100 by the Life Insurance Medical Research Fund of New York for research by Dr. Elliot V. Newman on the dye dilution principle for describing circulatory systems.

University of Tennessee College of Medicine, Memphis, has been awarded $10,584 by the Life Insurance Medical Research Fund of New York for research by Dr. Donald B. Zilversmit on the role of phospholipids in the deposition and mobilization of arterial lipids.

Two associate professors, Division of Physiology at the University of Tennessee Medical Units, Memphis, have been awarded grants by the American Heart Association: Dr. Robert C. Little, $2,993 for the study of production of heart sounds; and Dr. C. Riley Houck, $7,770 for the study of hypertension in nephrectomized dogs.

Dr. Lester Van Middlesworth, assistant professor, Division of Physiology, University of Tennessee Medical Units, Memphis, has been awarded a $5,463 research grant by the United States Public Health Service, which will be employed to compare the metabolism of radioactive iodine in cystic and non-cystic thyroid adenomas with the metabolism in normal thyroid tissue.

Dr. Watt Yeiser and Dr. Robin Lyles, Columbia, have purchased the Doctors Clinic in Columbia and plan to move their offices to the new clinic early next year.

TEXAS

Dr. F. J. L. Blasingame, Wharton, was elected president-elect of the Texas Medical Association at its One Hundredth Anniversary meeting held in Houston the latter part of April.

Dr. Milford O. Rouse, Dallas, was elected a delegate to the American Medical Association at the recent annual meeting of the Texas Medical Association.

Dr. Cecil O. Patterson, Dallas, was elected president of the Texas Society of Gastroenterologists and Proctologists at its annual meeting held in Houston the latter part of April.

Continued on page 56

the leader in research

mattern

creator of push-button controls now brings you an important advance in X-Ray Technology:

"DUOTECH" CONTROL UNIT®

with the "DUOTECH" you get consistently better results with *MODERATELY PRICED* equipment, formerly obtainable *only* with the most expensive!

•"DUOTECH" Milliampere Second (MaS) Integrator gives a revolutionary concept of accuracy in radiographic quality control with the fastest possible time of exposure. You get radiographs of consistent density regardless of power line conditions or other factors . . . and the shorter exposure time gives sharper detail.

•The "DUOTECH" Simplified Technique reduces the usual 3 operational steps to 2. The Technician makes only 2 selections: MaS and PKV. It's easier and faster, while giving complete protection to the X-ray tube.

send today for free booklet ▶

MATTERN X-RAY

F. MATTERN MFG. CO.

F. Mattern Mfg. Co.
4535-59 No. Cicero Ave.
Chicago 30, Illinois

☐ *Please send me free booklet about the "DUOTECH"*
☐ *Have your dealer call for appointment*

Name_____
Address_____
City_____ State_____ Phone_____

summer

the diarrhea season!

For over 30 summers, Dryco has been a food of choice in cases of upset stomach, fermentative diarrhea and impaired infant digestion — conditions that add to the burden of the already summer-wilted physician.

contains no added carbohydrate

DIARRHEA. In simple or nonspecific diarrheas, Dryco without added carbohydrate is indicated. Symptomatic relief is usually achieved with a Dryco formula diluted 1 tablespoonful Dryco with 3 ounces of water.

low in fat high in protein

VOMITING. "Feedings containing a large proportion of fat leave the stomach slowly, so that complete emptying of the stomach may not occur before the next feeding is given. Such conditions predispose to vomiting."* Dryco with its low fat, high protein and moderate carbohydrate is usually effective in relieving this vomiting.

Additional data and samples will be mailed on request.

*Jeans, P. C., and Marriott, W. McKim: Infant Nutrition, ed. 4, St. Louis, C. V. Mosby Co., 1947.

Dryco® *Each tablespoonful supplies 31½ calories. Enriched with vitamins A and D. Available at pharmacies in 1 and 2½ lb. cans.*

for the summer infant formula

Prescription Products Division, The Borden Company, 350 Madison Avenue, New York 17

Continued from page 54

University of Texas Medical Branch, Galveston, has been awarded $13,824 by the Life Insurance Medical Research Fund of New York for research by Dr. H. G. Swann on interstitial pressure in the kidneys.

VIRGINIA

Virginia Society of Anesthesiologists at its recent annual meeting held in Richmond elected Dr. Harold F. Chase, Charlottesville, president; Dr. W. E. Pembleton, Richmond, vice-president; and Dr. John L. Rosenthal, Norfolk, secretary-treasurer.

Dr. Galen G. Craun has been elected president of the Harrisonburg Rotary Club and will take office July 1.

Dr. Paul J. Christenson recently resigned as health officer of Alleghany-Bath-Highland Health District.

Dr. Walter Johnson recently retired as health officer of Fauquier-Prince William-Rappahannock Health District and was replaced by Dr. L. T. Giles.

Dr. George Zur Williams, professor of pathology and director of the tumor clinic at the Medical College of Virginia, Richmond, has been granted a year's leave of absence to organize a clinical pathology department at the National Institute of Health at Bethesda, Maryland, but will make frequent trips to Richmond to continue his cancer research work here. Dr. Williams will establish the department in a recently completed 500-bed clinical center at Bethesda.

WEST VIRGINIA

The State Board of Health has awarded the contract for the contsruction of the new state hygienic laboratory in South Charleston which provides that the building is to be completed within a year. The construction is being financed by federal funds and a state legislative appropriation of $200,000.

Dr. Johnsey L. Leaf, Richwood, recently released from military service, has resumed his practice at Richwood, where he is a member of the McClung Hospital staff.

Dr. W. H. Parker, formerly of Braeholm and who for the past three years has been located at Daytona Beach, Florida, has moved to Princeton.

Dr. E. S. Carter, Jr., formerly of Montgomery, has accepted a Fellowship in internal medicine at Johns Hopkins Hospital, Baltimore, Maryland. He has also had a Fellowship in internal medicine at the Lahey Clinic, Boston, Massachusetts.

Dr. Henry M. Brown, Belle, plant physician for E. I. DuPont de Nemours Company, retired May 1st after 33 years' service with this company. Dr. Brown is now county health commissioner of Clinton County, Ohio and is located at Wilmington, Ohio.

Dr. Edwin A. Davis, Charleston, is one of two doctors honored by the American Academy of General Practice for contributing the most significant articles published in *GP* during 1952. The award of $1,000 was made during the recent annual meeting of the Academy held in St. Louis, Missouri.

West Virginia Chapter of the American College of Surgeons at its recent meeting elected Dr. Hampton St. Clair, Bluefield, president; Dr. T. Kerr Laird, Montgomery, vice-president; and Dr. John C. Condry, Charleston, secretary-treasurer, re-elected.

Dr. Russell L. Heinlein, Huntington, has accepted a residency in neuropsychiatry at the Veterans Administration Hospital, Roanoke, Virginia.

Dr. George B. Pantera, Oak Hill, is moving to Buffalo, New York, where he will continue the practice of otolaryngology.

Dr. Richard G. Mehne, Williamson, has moved to Brazil, Indiana.

Dr. Elliot M. Namay, Eskdale, has moved to Miami, West Virginia.

Dr. Maxine R. Perdue, formerly of Summersville, is practicing in Miami, Florida.

Dr. George R. Cunningham, formerly of Tams, has moved to New Castle, Pennsylvania.

Dr. A. L. Allen, formerly of Huntington, has located at Ashland, Kentucky.

Dr. Louis S. Smith, former pathologist at St. Francis Hospital, Charleston, has moved to Dallas, Texas.

In Spastic Colitis

NUBILIC

In gastrointestinal dysfunctions such as spastic colitis, which is often associated with biliary stasis, the hydrocholeretic—antispasmodic—sedative action of NUBILIC is of benefit. The pure dehydrocholic acid tends to soften the stool without presenting an immediate possibility of a diarrhea.

Each NUBILIC tablet contains: Dehydrocholic acid . . 0.25 Gm. (3¾ gr.) Phenobarbital . . 8 mg. (⅛ gr.) Belladonna . . 8 mg. (⅛ gr.)

Average Dose: 1 to 2 tablets three times daily, after meals.

Supplied: Bottles of 25, 50 and 100.

NUMOTIZINE, Inc. 900 N. Franklin St. Chicago, Ill., U.S.A.

why **DESITIN®**

hemorrhoidal

SUPPOSITORIES

with **cod liver oil**

are safe, conservative therapy in **hemorrhoids**

more effective.... because they provide healing crude Norwegian cod liver oil (rich in vitamins A and D and unsaturated fatty acids, in proper ratio for maximum efficacy).

more comforting... emollient, protective, lubricant to relieve pain, itching and irritation rapidly...to minimize bleeding and reduce congestion.

safe, conservative..... contain no styptics, narcotics or local anesthetics, so they will not mask serious rectal disease. Easy to insert and retain.

Composition of Desitin Suppositories: crude Norwegian cod liver oil, lanolin, zinc oxide, bismuth subgallate, balsam peru, cocoa butter base. Boxes of 12 foil-wrapped suppositories.

for **samples,** please write .... **DESITIN** CHEMICAL COMPANY ●
70 Ship Street • Providence 2, R. I.

Saint Albans Sanatorium

RADFORD, VIRGINIA

100 bed private psychiatric hospital for the treatment of nervous and mental disorders, including alcoholism and addiction.

James P. King, M.D.
Director

James K. Morrow, M.D. Thomas E. Painter, M.D. Daniel D. Chiles, M.D.

James L. Chitwood, M.D.
Medical Consultant

BRAWNER'S SANITARIUM

ESTABLISHED 1910

SMYRNA, GEORGIA

(SUBURB OF ATLANTA)

FOR THE TREATMENT OF PSYCHIATRIC ILLNESSES AND PROBLEMS OF ADDICTION

Psychotherapy, Convulsive Therapy, Recreational and Occupational Therapy

Modern Facilities

Custodial Care for a Limited Number of Elderly Patients at Monthly Rate

JAS. N. BRAWNER, M.D.
MEDICAL DIRECTOR

JAS. N. BRAWNER, JR., M.D.
ASSISTANT DIRECTOR AND SUPERINTENDENT

ALBERT F. BRAWNER, M.D.
RESIDENT SUPERINTENDENT

P. O. Box 218 **Phone 5-4486**

Allen's
INVALID HOME

ESTABLISHED 1890

MILLEDGEVILLE, GEORGIA

For the treatment of

NERVOUS AND
MENTAL DISEASES

Grounds 600 Acres — Buildings, Brick
Fireproof — Comfortable — Convenient

Site High and Healthful

E. W. ALLEN, M.D. — DEPARTMENT FOR MEN

H. D. ALLEN, M.D. — DEPARTMENT FOR WOMEN

Terms Reasonable

CITY VIEW
SANITARIUM

For the diagnosis and treatment of nervous and mental disorders, and addictions to alcohol and drugs.

Established 1907

NASHVILLE, TENNESSEE

St. Elizabeth's Hospital

Richmond 20, Virginia

Staff

Guy W. Horsley, M.D. . . General Surgery and Gynecology
D. Coleman Booker, M.D. . . . . General Surgery and Gynecology
Austin I. Dodson, M.D. . . . . Urology
Austin I. Dodson, Jr., M.D. . . . . Urology
Douglas G. Chapman, M.D. . . . . Internal Medicine
Elmer S. Robertson, M.D. . . . . Internal Medicine
T. E. Stanley, M.D. . . . . Internal Medicine
Fred M. Hodges, M.D. . . . . Roentgenology
L. O. Snead, M.D. . . . . Roentgenology
Hunter B. Frischkorn, Jr., M.D. . . . . Roentgenology
Helen Lorraine . . . . . Medical Illustration

Administration

William Scott . . . . . Business Manager

School of Nursing

The School of Nursing is affiliated with the Johns Hopkins Hospital School of Nursing for a three months' course each in Pediatrics and Obstetrics, and with Tucker's Hospital in Richmond for a 12 weeks' course in Psychiatry.

Address: Superintendent of Nurses

TUCKER HOSPITAL, INC.

212 West Franklin St. (Corner of Madison)

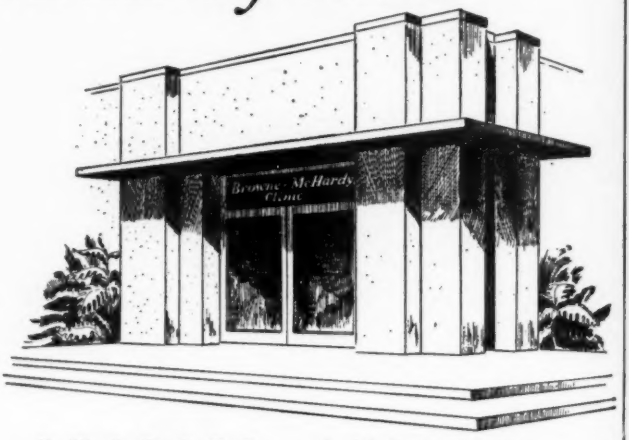
RICHMOND, VIRGINIA

This is a private Hospital for the Neurological practice of Drs. Beverly R. Tucker, Howard R. Masters and James Asa Shield.

The Tucker Hospital is for the treatment of nervous and endocrine diseases. There are departments of massage, medicinal exercises, hydrotherapy and physiotherapy. The Hospital is large and bright, surrounded by a lawn and shady walks, large veranda and has a roof garden. It is situated in the best part of Richmond and is thoroughly and modernly equipped. The nurses are specially trained in the care of nervous cases.

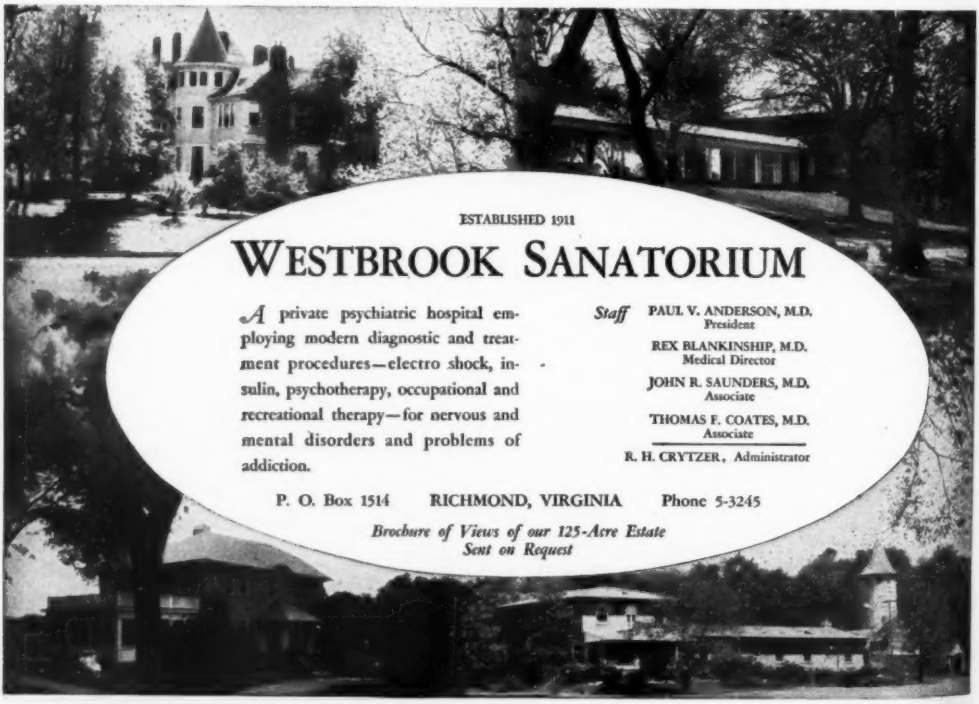
Browne-McHardy Clinic

- Diagnostic and Therapeutic Facilities
- Internal Medicine and Gastroenterology
- Surgery
- Gynecology and Obstetrics
- Radiology—X-ray and Radium therapy
- Laboratory and Research Departments
- Urology
- Endoscopy
- Otolaryngology-Ophthalmology
- Neuropsychiatry
- Hotel facilities available



3636 ST. CHARLES AVENUE

Phone TYler 2376 • *New Orleans, La.*



ESTABLISHED 1911

WESTBROOK SANATORIUM

A private psychiatric hospital employing modern diagnostic and treatment procedures—electro shock, insulin, psychotherapy, occupational and recreational therapy—for nervous and mental disorders and problems of addiction.

Staff
PAUL V. ANDERSON, M.D.
President
REX BLANKINSHIP, M.D.
Medical Director
JOHN R. SAUNDERS, M.D.
Associate
THOMAS F. COATES, M.D.
Associate
R. H. CRYTZER, Administrator

P. O. Box 1514 RICHMOND, VIRGINIA Phone 5-3245

Brochure of Views of our 125-Acre Estate Sent on Request

THE WALLACE HOSPITAL

W. R. WALLACE, *Superintendent*

Memphis, Tennessee

For the Diagnosis and Treatment of Nervous and Mental Diseases, Drug Addiction and Alcoholism.

APPALACHIAN HALL

ASHEVILLE, NORTH CAROLINA

An institution for rest, convalescence, the diagnosis and treatment of nervous and mental disorders, alcohol and drug habituation.

Appalachian Hall is located in Asheville, North Carolina. Asheville justly claims an unexcelled all year round climate for health and comfort. All natural curative agents are used, such as physiotherapy, occupational therapy, shock therapy, outdoor sports, horseback riding, etc. Five beautiful golf courses are available to patients. Ample facilities for classification of patients. Rooms single or en suite with every comfort and convenience.

For rates and further information write

Appalachian Hall, Asheville, N. C.

Wm. Ray Griffin, M.D. M. A. Griffin, M.D.

Major Carl L. Sitter, USMC Medal of Honor

THE HILL WAS STEEP, snow-covered, 600 feet high. Red-held, it cut our lifeline route from Hagan-ri to the sea; it had to be in our hands.

Up its 45-degree face, Major Sitter led his handful of freezing, weary men—a company against a regiment! The hill blazed with

enemy fire. Grenade fragments wounded the major's face, chest, and arms. But he continued heading the attack, exposing himself constantly to death, inspiring his men by his personal courage. After 36 furious hours the hill was won, the route to the sea secured. Major Sitter says:

"Fighting the Commies in Korea has taught me one thing—in today's world, *peace is only for the strong!* The men and women of America's armed forces are building that strength right now. But we need your help—and one of the best ways you can help us is by buying United States Defense Bonds.

"So buy bonds—and more bonds—starting *right now.* If you at home, and we in the service, can make America stronger *together,* we'll have the peace we're working for!"

★ ★ ★

Remember, when you're buying bonds for national defense, you're also building a personal reserve of cash savings. Remember if you don't save *regularly,* you generally don't save at all. Money you take home usually is money spent. Sign up today in the Payroll Savings Plan where you work, or the Bond-A-Month Plan where you bank. For your country's security, and your own, buy U. S. Defense Bonds now!

Peace is for the strong...
Buy U. S. Defense Bonds now!

The U. S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

HILL CREST SANITARIUM

FOR NERVOUS AND MENTAL DISEASES AND ADDICTIONS

Insulin and Electro-Shock Therapy used in Selected Cases. Gradual Reduction Method used in the Treatment of Addictions.
Established in 1925

Thoroughly modern in architecture and construction. Eight departments—affording proper classification of patients. All outside rooms, attractively furnished. Several bathrooms and rooms with private bath on each floor. Also a spacious sun parlor in each department. Located on the crest of Higdon Hill, 1050 feet above sea level, overlooking the city, and surrounded by an expanse of beautiful woodland. Ample provision made for diversion and helpful occupation. Adequate night and day nursing service maintained.

James A. Becton, M.D., Physician-in-charge **James Keene Ward, M.D., Associate Physician**
P. O. Box 2896, Woodlawn Station, Birmingham 6, Ala. **Phones 9-1151 and 9-1152**

STUART CIRCLE HOSPITAL

413-21 Stuart Circle

RICHMOND 20, VIRGINIA

Medicine:
ALEXANDER G. BROWN, JR., M.D.
MANFRED CALL, III, M.D.
M. MORRIS PINCKNEY, M.D.
ALEXANDER G. BROWN, III, M.D.
JOHN D. CALL, M.D.

Obstetrics and Gynecology:
WM. DURWOOD SUGGS, M.D.
SPOTSWOOD ROBINS, M.D.

Orthopedics:
BEVERLEY B. CLARY, M.D.

Pediatrics:
CHARLES P. MANGUM, M.D.
ALGIE S. HURT, M.D.

Ophthalmology, Otolaryngology:
W. L. MASON, M.D.

Pathology:
REGENA BECK, M.D.

Surgery:
A. STEPHENS GRAHAM, M.D.
CHARLES R. ROBINS, JR., M.D.
CARRINGTON WILLIAMS, M.D.
RICHARD A. MICHAUX, M.D.
CARRINGTON WILLIAMS, JR., M.D.

Urological Surgery:
FRANK POLE, M.D.

Oral Surgery:
GUY R. HARRISON, D.D.S.

Roentgenology and Radiology:
FRED M. HODGES, M.D.
L. O. SNEAD, M.D.
HUNTER B. FRISCHKORN, JR., M.D.
WILLIAM C. BARR, M.D.

Physiotherapy:
LIV E. LUND

Director:
CHARLES C. HOUGH

uncomplicated progress . . .

Tolerance of feedings	good
Incidence of digestive disturbances	low
Growth response	satisfactory
Discontinuation of night feeding	early
Health and development	excellent

The uncomplicated nutritional progress[1] of infants fed Lactum® speaks for its sound rationale. Lactum is Mead's liquid formula made from whole milk and Dextri-Maltose.® It provides generous milk protein for sturdy growth and sound tissue structure, with sufficient calories to spare protein and meet the infant's energy needs.

Lactum is convenient and easy to prepare—simply mix equal parts of Lactum and water for a formula supplying 20 calories per fluid ounce.

1 Frost, L. H., and Jackson, R. L.: J. Pediat. 39: 585-592, 1951.

Lactum

MEAD

MEAD JOHNSON & COMPANY
Evansville 21, Ind., U.S.A.

when psychic stress

is the underlying cause of

BACK PAIN or HEADACHE

Edrisal* relieves the psychic stress

Edrisal's Benzedrine† component improves the patient's mood and creates a sense of well-being, thus relieving the depression that so often is the underlying cause of pain.

'Edrisal' relieves the pain

"'Edrisal' was more effective than any other analgesic previously used..."

Wells, R. L.: M. Ann. District of Columbia *20*:360, 1951.

Each 'Edrisal' tablet contains:

'Benzedrine' Sulfate (racemic amphetamine sulfate, S.K.F.)	2.5 mg.
Acetylsalicylic acid	2.5 gr.
Phenacetin	2.5 gr.

Be sure to prescribe 2 'Edrisal' tablets per dose to assure the full benefit of the 'Benzedrine' component.

Also available, for intense pain: 'Edrisal with Codeine ¼ gr.'

Smith, Kline & French Laboratories, Philadelphia

*T.M. Reg. U.S. Pat. Off.

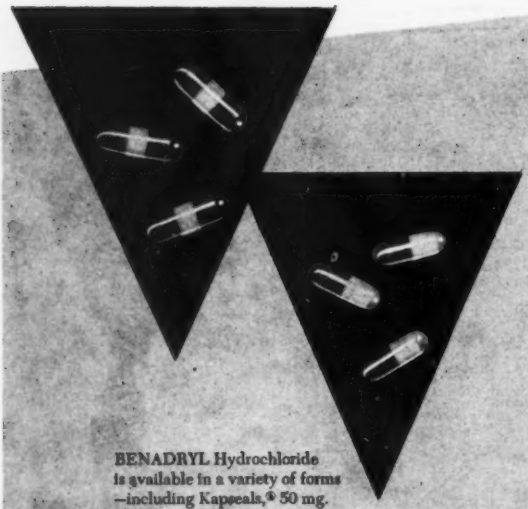
†T.M. Reg. U.S. Pat. Off. for racemic amphetamine sulfate, S.K.F.

a standard measure

to avert or allay

allergic distress...

BENADRYL®



BENADRYL Hydrochloride is available in a variety of forms —including Kapseals,® 50 mg. each; Capsules, 25 mg. each; Elixir, 10 mg. per teaspoonful; and Steri-Vials,® 10 mg. per cc. for parenteral therapy.

Whenever antihistaminic therapy is needed to prevent or relieve allergic symptoms, prescription of BENADRYL (diphenhydramine hydrochloride, Parke-Davis) has become a customary procedure in the daily practice of many physicians. Because relief is rapidly obtained and gratifyingly prolonged, many thousands of patients have been spared the usual discomforts of hay fever, vasomotor rhinitis, acute and chronic urticaria, angioneurotic edema, pruritic dermatoses, contact dermatitis, serum sickness, food allergy, and sensitization to penicillin and other drugs.

MEDICAMENTA FIDA

Parke, Davis & Company

DETROIT, MICHIGAN